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MAIZE OIL, OR OIL OF CORN.

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(Paper read at the Annual Meeting of the Ohio Pharm. Association at Columbus.)

It is well known that Indian corn contains considerable quantities of fixed oil and, some years ago, endeavors were made to separate this oil on a large scale from the ground corn before it was mashed in the making of whiskey. The writer remembers that the late John Crawford, well known as a Cincinnati pharmacist, embarked in a venture with this object in view, and established a factory in Kentucky opposite the city of Cincinnati for the purpose of making bisulphide of carbon, which was used as a solvent to dissolve the oil. The corn meal was percolated with this bisulphide of carbon, whereby the fixed oil was removed, and the bisulphide of carbon was afterward recovered by distillation.

It was thought by Mr. Crawford that the corn meal so treated yielded a larger amount of whiskey and of finer quality than when the crude meal was worked. However, after devoting some years to this industry and establishing the process in several sections of the country in connection with distilleries, it was found, I think, that objections rendered it impracticable, and that the advantages derived from the process were more than overcome by the disadvantages that followed. In consequence, if I remember correctly, even before Mr. Crawford's death, the scheme was dropped and the industry abandoned.

It has been found in the making of starch and perhaps in other directions as well, that it is desirable to get rid of the germ of the corn, as for reasons that it is unnecessary for me to mention this germ is objectionable in these manipulations.

In order to accomplish this result, a machine has been devised which degerminizes the corn, throwing the hard starchy part of the corn in one direction and separating the germs in another, and this method can be, and is applied to the making of starch in large quantities and is found to be of great assistance and advantage.

Naturally, there was an accumulation of these excluded germs which, as is well known, constitute a considerable proportion of the corn, and they became a by-product. They were found to be valuable as a feed for stock, but really were too "rich" for such purposes, containing as they did such an enormous quantity of oil, the oil of the corn being altogether found in the germ. In order to render the material more acceptable as a feed for stock, a company was recently established for the purpose of squeezing the fixed oil from the germs and thus improving the feed meal. A plant was established a few months ago (the only one in existence, now, I learn) in the city of Cincinnati for this purpose and is now in operation. The method is very simple. The germs are conveyed from the factories, wherein they are a by-product (such as starch factories), and are first purified by separating from them a considerable amount of bran or husk of corn that adheres to them or is mixed with them. They are then steamed under pressure so as to soften them, after which, in the usual manner by means of hydraulic presses, the oil is squeezed from them.

The process is a very simple one and it yields an oil cake which, when ground into meal, is found to be exceedingly valuable as a food for stock, the manufacturers of this meal claiming that it is superior to corn meal that is made from the whole corn.

Thus it is that in addition to the oil cake, which is the prime object of the industries, there is an accumulation of the fixed oil of corn or maize oil, which induces this paper. I accidentally came across the oil, was led to its examination, and as a result found that it is in many respects preferable, as I believe, to cotton-seed oil that has recently become officinal in the Pharmacopœia as a substitute for olive oil. I have used it in the making of ammonia liniment to which purpose it is particularly adapted, and in which, to my experience, cotton-seed oil is practically a failure.

Oil of corn saponifies *immediately*, forming with ammonia a smooth, creamy emulsion that retains its nature apparently indefinitely, as specimens that I have in my possession, and which I herewith exhibit, are quite old and are now in their original condition. It does not clot and form masses or curd-like aggregations, as we sometimes find to result with olive oil, in accordance with the manner in which the ammonia is added to it, and even if for no other use than the making of ammonia liniment, I think it should become officinal instead of cotton-seed oil. However, I doubt if there is any preparation in the Pharmacopœia that demands olive or cotton-seed oil in which it cannot be used, and probably it will be found superior in all other directions. The industry that yields this oil, in course of time, promises to increase, and the oil will likely be obtained in unlimited amounts. Indeed it can now be obtained in any quantity, car load or otherwise. It is not probable that the output will ever be less than the demand. It is peculiarly, and of necessity, an American production, and will always probably be at our command.

The price is reasonable, in car loads being now 40 cents per gallon. Of course, in smaller quantities as it will be obtained by the retail druggists, there will be an increase probably reaching to 60 cents; but even if the price should be equal to that of cotton-seed oil, or a little above it, so far as I am concerned, I say that it has proved in my hands enough superior to cotton-seed oil, for the making of volatile liniment (wherein I suggest its employment) to merit a better price.

Properties.—Maize oil has been analyzed by an English chemist, and the well-known authority, Prof. Chas. O. Curtman, M.D., of St. Louis, has determined its character as follows:

"Oil from embryo of Indian corn, in unrefined state, has a specific gravity of 0.916 at 15° C., which is nearly that of pure olive oil (0.915 to 0.918).

The elaidine test shows the presence of a large quantity of oleine, intermediate in quantity between olive and cotton-seed oils.

Its color is a pale yellowish-brown; its odor and taste that of freshly ground cornmeal.

It belongs to the non-drying group of the vegetable oils, experiments showing that a very thin layer on paper does not in three weeks' time form a pellicle on the surface exposed to air. In this respect it closely resembles the oils of olive, almond, colza, rapeseed, etc.

It does not very rapidly become rancid by exposure to air, and in this regard compares favorably with the best oils.

Its use produces no specific purgative effect, any more than olive oil.

With ammonia or solutions of caustic alkalies it rapidly saponifies, forming a white soap."

Analysis by F. Williams, Liverpool, England.

Fatty Acids (free)	0.88
Total Fatty Acids	96.70
Unsaponifiable, Mucilaginous and Albuminous Bodies	1.34

[ORIGINAL ABSTRACT.]

CONVERSION OF HYOSCYAMINE INTO ATROPINE.

A further and most important step in the chemistry of the solanaceous alkaloids has been made by the discovery that hyoscyamine can be converted into atropine in a very simple manner.

[This fact had been announced already, during last year, by Prof. Ernst Schmidt, in a paper read before the Naturforscherversammlung (Section Pharmacy) at Wiesbaden, but no official report was made of this paper.]

W. Will investigated the relationship of atropine, hyoscyamine, and hyoscine at the request of the Chemische Fabrik auf Aktien (late E. Schering), of Berlin.

In this factory very large quantities of belladonna root have latterly been worked up under various precautions. In the course of these operations it was observed that the relative quantity of atropine and hyoscyamine differed very much, according to the process used in extracting the alkaloids—a fact which is already recorded in the older literature. But while it was heretofore supposed that the varying yield was due to an original variation in the total amount of alkaloids contained in the root, or else to the fact that one or the other process extracted proportionately more (or less) of one alkaloid, the experiments conducted at Schering's factory showed that

> *one and the same root yielded the more hyoscyamine, and the less atropine, the more carefully the process was conducted.*

In fact, it has been ascertained that if the process is carried out to perfection, *belladonna yields only hyoscyamine and no atropine at all.* If the process, however, is less carefully conducted, more or less atropine is obtained, the total yield of alkaloids in both cases being about the same.

These results showed that during the process of manufacture, hyoscyamine is liable to be converted into atropine. To test this practically, the author was put in possession of the requisite material and factory records. He has found that hyoscyamine can indeed be quite easily converted into atropine, and that the conditions under which this change takes place can easily occur during the extraction of the alkaloids, if the methods laid down in the text-books are used.

Before the author began his experiments on the conversion of hyoscyamine into atropine, he assured himself of

the identity and purity of the material placed at his disposal.

While his results of the examination of this material show that it was pure hyoscyamine, yet he found the latter to differ in a few respects from the substance as described by others. Ladenburg had announced that he could not obtain simple crystallized salts of hyoscyamine; also doubted the statements of previous authorities regarding these salts, and inclined to believe that the alkaloid they had had in hand was hyoscine. Will, however, has prepared from his lot of hyoscyamine a whole series of crystallized salts, which are undoubtedly true hyoscyamine (*not* hyoscine) salts.

Sulphate of hyoscyamine crystallizes from alcohol in fine, colorless needles, resembling sulphate of atropine. The crystals melt at 206° C. When dried at 100° C., the salt has the composition $(C_{17}H_{23}O_3)_2H_2SO_4$. With hydrochloric acid and chloride of gold it yields the characteristic crystalline double chloride of gold and hyoscyamine. The hydrobromate crystallizes in large crystals, upon evaporation of its aqueous solution.

Former investigations have shown that hyoscyamine in aqueous solution turned the plane of polarized light to the left, the specific rate being determined by Poehl and Ladenburg to be about —14.5°. Will has found that various samples of hyoscyamine placed in his hands yielded uniform but much higher figures, the mean of a series of experiments being —20.97°. This circumstance appears to the author a further proof that he had a purer material under his hands than any observer before him.

The author now describes *two* methods by which hyoscyamine is converted into atropine.

One is by *melting*. The author's experiment was made upon 5 Gm. of hyoscyamine, which were exposed for 5 hours to a heat of 109°–110° C. in a bath of chloride of sodium solution. The result was the almost complete conversion of the alkaloid into atropine. The conditions, however, under which this change occurs do not exist during the process of manufacture of the alkaloids, and since nevertheless a conversion of one alkaloid into the other was observed to take place in the course of manufacture, some other cause of the change had to be searched for by the author.

Conversion of Hyoscyamine into Atropine at ordinary Temperature by dilute Solution of Soda.

A solution of pure hyoscyamine in alcohol may long be preserved without undergoing any change. On evaporating the alcohol at the ordinary temperature, only hyoscyamine results again. If such a solution is introduced into a polarizing tube it will be found that it does not change its rate of polarization during several days. But if *one* drop of an alcoholic solution of soda be added to such a solution, and its polarizing power be examined, it will be found that it gradually diminishes, and finally descends to 0 [atropine, in alcoholic solution, is optically inert].

One gramme of a ten-per-cent solution is thus completely rendered optically inactive within two hours by one drop of a solution of soda.

[That the resulting alkaloid was atropine was proven in various ways.]

It is, therefore, demonstrated that hyoscyamine is converted, at the ordinary temperature, completely into atropine, under the influence of a trace of alkali. And the author adds, in a foot-note, that the same effect seems to be produced by warming the alkaloid for some time with dilute hydrochloric acid.

Regarding the influence of the kind and quantity of the alkali upon the duration of the reaction, experiments are under progress. The rate of the reaction may be easily controlled by means of the polarizing apparatus. It is probably proportionate to the co-efficient of affinity of the bases. Ammonia produces the change likewise, but only very slowly.

This transformation explains, in a very simple manner, the various statements made by different experimenters regarding the variation in yield of either alkaloid from the same or from different roots. During the manufacture, the alkaloid is always set free by means of an alkali, and the relative proportions of the two must be greatly influenced also by the rate of concentration of the solution, and by the length of time during which they are in contact with the alkali.

It is now also easy to understand the fact reported by Prof. E. Schmidt, viz., that the crystallized residues obtained from the mother liquors of crude atropine and crude daturine yield fresh quantities of the higher-melting alkaloid, if they are once more dissolved in hydrochloric acid, then precipitated with carbonate of potassium, and the separated oily base allowed to stand for some time until it solidified.

It is known that the study of the bases isolated from plants has repeatedly shown the former to consist of several bodies having the same empirical composition (such as quinine, quinidide, etc.), and also that the alkaloidal product obtained by various processes contains these isomeric bodies in very varying proportions. On closer study, it is quite possible that similar transformations will be found to take place under the influence of the reagents used for isolating the alkaloids.

The author announces that he will investigate these isomeric alkaloids for this purpose.

A Few Artificial Mineral Waters.

EUGENE DIETERICH gives a series of mixtures for artificial mineral water (in the *Pharm. Centralhalle*, Nos. 21 and 22), from which we select a few of those in demand in this country.

1. *Pullna Bitter Water.*

Sodium Sulphate, dry	115 parts.
Potassium Sulphate	6 "
Sodium Chloride	25 "
Sodium Bicarbonate	17 "
Magnesium Sulphate, dry	190 "
Calcium Sulphate, precip.	6 "

Taken in grammes, the mixture will serve for 10 liters (10½ quarts) of artificial bitter water.

To prepare an average dose, put a tablespoonful of the salt into a half-pint bottle, fill it half full of water, dissolve by agitation, and then fill the bottle with carbonic acid water.

2. *Hunyadi János Water.*

Potassium Sulphate	0.5 parts.
Sodium Chloride	14.0 "
Sodium Bicarbonate	52.0 "
Sodium Sulphate, dry	180.0 "
Calcium Sulphate, precip.	15.0 "
Magnesium Sulphate, dry	24.5 "
Iron Sulphate, dry	0.2 "

Taken in grammes, the mixture will serve for 10 liters (10½ quarts) of the artificial water.

Dose, as in preceding.

3. *Pyrmont Water.*

Lithium Carbonate	0.1 parts.
Sodium Bicarbonate	26.0 "
Sodium Sulphate, dry	34.0 "
Sodium Chloride	84.0 "
Magnesium Sulphate, dry	27.0 "
Calcium Sulphate, precip.	24.0 "
Iron Sulphate, dry	0.12 "

The same remarks, as given under 1 and 2, apply here.

4. *Ems, "Kraenchen."*

Sodium Chloride	9.0 parts.
Sodium Bicarbonate	2.2 "
Potassium Sulphate	0.4 "
Calcium Sulphate, precip.	2.8 "
Magnesium Sulphate, dry	2.1 "

Taken in grammes, the mixture will serve for 10 liters (10½ quarts) of the artificial water.

Dose: Put as much as will go on the point of a knife [about 20 grains] in a half-pint bottle, fill this two-thirds full with "soda water" (see below), and then fill the bottle completely with boiling water. The product is either drank by itself, or in combination with hot milk. In the latter case, the bottle is filled with boiling hot milk instead of water.

["Soda-water" is meant by the author to be carbonic water containing a small amount, about 0.1 per cent of carbonate of sodium.]

5. *Karlsbad, Kissingen, and Vichy Water.*

Formulæ for this are contained in the new National Formulary of the Amer. Pharm. Assoc., and need not be repeated here.

6. *Friedrichshall Bitter Water.*

Two formulæ for this will be found in our answers to Queries in this number.

Alpha-Naphthol as an Antiseptic.

ALPHA-NAPHTHOL is insoluble in cold water. One liter of dilute alcohol, containing 40 per cent of absolute alcohol, dissolves 10 grammes of the substance. J. Maximovitch (*Comptes Rend.*) has studied the antiseptic action of this substance towards 14 different microbes, and finds that alpha-naphthol acts more strongly antiseptic than does beta-naphthol, according to the recent researches of Bouchard. At the same time, alpha-naphthol is less injurious to the animal organism than beta-naphthol. In order to kill a rabbit, 9 grammes of alpha-naphthol must be used for every kilo of the weight of the animal, showing that it is three times less poisonous than beta-naphthol, and 700 times less than mercuric iodide.

Improved Process for making Hydrochlorate of Quinine.

L. B. WELD has patented the followed process for making hydrochlorate of quinine.

Sulphate of quinine disolved in alcohol is boiled with a solution of sodium chloride in excess in an open or closed vessel for about 10 minutes; the proportions are about one part of quinine sulphate to four parts of sodium chloride and 50 parts of alcohol. On concentration, the sodium sulphate and chloride separate first, and then the hydrochlorate of quinine, which can readily be obtained in the crystalline state.

A KNEADING MACHINE FOR PILL MASSES, OINTMENTS, ETC.

MESSRS. WERNER and PFLEIDERER, of London, are the manufacturers of a strong and compact kneading machine, which is very useful for making pill-masses, or mixing ointments, plasters, or other similar compounds, in quantities from about ½ pound upwards. It is made in various sizes, to be worked either by hand or by steam-power. We give an illustration of one of the smaller sizes.

This machine is capable of working from 2 to 4 pounds of any kind of mass, in from 5 to 15 minutes, under proper manipulation. The speed of working can be altered at will, to suit the consistence of the mass, by simply shifting the handle to another shaft, there being three of the latter. A soft, pliable mass will be best worked at a higher speed, while very hard or tough masses will require a slow speed. Fig. 1 shows the machine as it appears when screwed fast to a table. Fig. 2 shows it tilted back for discharging the kneaded material. This is accomplished by simply releasing the catch which holds down the machine by the rim of the trough, and pulling the trough over by hand, at the same time slowly turning the shaft in the reverse or outward direction, so as to allow the mass to disengage itself from the blades. The interior construction will be understood by examining Fig. 3, which represents a machine of the smallest size made, intended for about 1 pound of mass.

The cubic contents, that is, the volume of liquid or solid required to fill the trough to the top of the blades is 1.2 pints for the smallest, and 3.5 pints for the next size. But the largest size, working up as much as 125 pounds of mass at a time, has a cubic capacity of 13.2 gallons. The prices of the two sizes described are £4.5.0 and £7.10.0.

FIG. 1. FIG. 2. FIG. 3.

Werner and Pfleiderer's kneading machine.

Assay of Argols, etc., for Tartaric Acid.

THE following improved process for determining tartaric acid in argols, etc., is proposed by Goldenberg, Geromont & Co. (in *Chem. Zeit.*)

Six grains of the finely powdered substance are stirred in a beaker with 9 C.c. of HCl (sp. gr. = 1.10), a like volume of water is now gradually added, and the mixture is digested with frequent stirring for 1—2 hours throughout, at the ordinary temperature. The liquid is now made up to 100 C.c. with water, and then passed through a dry filter. 50 C.c. are then placed in a well-covered beaker, to which 10 C.c. of K_2CO_3 solution (containing 3 Gm. K_2CO_3) are added; after boiling for some time the CO_2 will be completely expelled, and the $CaCO_3$ precipitate will have completely separated in the crystalline condition; after filtering and washing the latter, the solution is evaporated to about 10 C.c., acidified with 2—2.5 C.c. of glacial acetic acid, gradually introduced with constant stirring, mixed with 100 C.c. of pure alcohol of 90°—to 96° Fr., and stirred until the precipitate is distinctly crystalline. After frequent washings by decantation the precipitate is filtered through a 9-Cm. filter, which, with precipitate and dish, must be thoroughly washed free from acetic acid by means of alcohol. The filter, with the precipitate, is now transferred from the funnel into a beaker; the dish is washed with boiling water, which is then added to the substance in the beaker, and the whole is titrated with normal alkali. The number of C.c. of alkali used, multiplied by five, gives the percentage of tartaric acid in the lees. In making allowance for the volume of the residue insoluble in HCl, it is found that 0.7 per cent should be deducted from a yield of 20 per cent tartaric acid, or 0.7+0.2n from one of 20+n per cent. In analyzing tartar and calcium tartrate, 3 grammes of the substance are digested with 9 C.c. of the HCl; the solution is then filtered (the residue being well washed) and made up to 100 C.c., of which 50 C.c. are used for the subsequent stages as above. The percentage of tartaric acid is in this case found by multiplying by ten the number of C.c. of normal alkali used.—*J. S. Chem. Ind.*

Estimation of Emetine.

LIGNON gives the following process in the *Chem. Zeit.* Rub together 25 grammes of the powdered ipecacuanha root in 25 C.c. of water and 20 grammes of slaked lime, and after this has been well rubbed up add 30 grammes more of slaked lime, and treat the mixture with 300 C.c. of ether in a suitable extraction apparatus, filter the ethereal solution (about 200 C.c.) if it contains any solid matter, and make it up to 200 or 250 C.c. Place 50 C.c. of the solution in a 100-C.c. flask; to this add 10 C.c. of semi-normal sulphuric acid, and 4 to 5 drops of freshly-prepared concentrated extract of logwood. After thorough shaking, the mixture divides into a colorless ethereal layer and a yellow aqueous layer. The acids contained in the solution are neutralized by adding semi-normal ammonia, drop by drop, until the aqueous layer is colored red, and the difference between the amount found and that originally used shows the amount of alkaloid which has combined with the acid.

Croton Oil.

KOBERT has recently (*Chem. Zeit.*) attacked Senier's theory that there are two principles in croton oil—one a cathartic, and the other a vesicating body. His belief is that both effects are due to Buchheim's crotonolic acid, which exists in the oil partly as a glycoside, and may be prepared by treating the oil with a hot saturated aqueous solution of barium hydrate, whereby the fatty acids are precipitated. They are collected, well washed and dried, and the oleic and crotonolic salts dissolved out with ether. After evaporation the residue is treated with absolute alcohol, which dissolves out the barium crotonolate, which is decomposed with sulphuric acid. Kobert denies that the oil is separable by means of alcohol into the two portions mentioned by Senier, and states that the solubility of the oil depends mainly upon its age. Some varieties are soluble in all proportions; while crotonolic acid itself is readily soluble in alcohol, the solubility of the oil bears no relation to the quantity of free crotonolic acid present.

Estimation of Glucose in Urine.

THE urine is mixed with an equal volume of one-fifth normal baryta solution, filtered, and to 5 C.c. of the filtrate another 5 C.c. of baryta solution is added, together with 100 C.c. of 90% alcohol; after agitation, the solution is set aside for two or three hours. The precipitate is collected, washed with 20 C.c. of 90% alcohol, and thrown along with the filter into the precipitating flask, in which 10 C.c. of decinormal sulphuric acid has previously been placed. After warming and shaking, the excess of sulphuric acid is neutralized with standard baryta solution, using as an indicator not more than one drop of phenolphthaleïn solution (1 : 100). The barium sulphate is now filtered off, and the filtrate is evaporated to dryness, and weighed. The grape-sugar remains as a yellowish mass containing a little baryta, which is obtained as carbonate on ignition. This weighing of the sugar serves as a check on the volumetric estimation by means of the baryta precipitate, as described. The author concludes that:

I. Grape-sugar in aqueous solution can be very accurately estimated by the baryta method, either by titrating the baryta or by weighing the separated sugar. II. When baryta in sufficient excess is present, the aqueous solution of the barium sugar compound is precipitated as $BaO(C_6H_{12}O_6)_2 + BaO$ on the addition of so much alcohol that the mixture contains 81 to 86% of alcohol by volume. III. In the presence of only 68 to 70% of alcohol, the precipitate has the composition $BaO(C_6H_{12}O_6)_2$. IV. In diabetic urine, the results obtained with Fehling-Soxhlet's titration method agree closely with those yielded by the baryta method.—H. WILL in *Arch. d. Pharm.*, abst. in *J. Chem. Soc.*

Note on a Modified Process of Repercolation.

From a "Monograph on Fluid Extracts" presented by Mr. Josiah H. Lilly to the Missouri Pharmaceutical Association, we take the following remarks on processes of percolation, or methods of exhausting the drug:

The Officinal Method is, of course, the most practicable, most largely used by pharmaceutists, the process being sustained upon the grounds of convenience and practicability. We must confess, however, that the finished preparations are prone to precipitation and open to the objection of the necessary application of heat to the excess percolate. Hence it is not perfect.

Single Percolation with Reserve Percolate.—Is a process little known and still less practised. It is applied in the following manner: Say 16 troy ounces of drug is packed, macerated in the usual manner, percolation started, and but 75%—12 fluid ounces—allowed to escape. This is put in stock as fluid extract. Percolation is then continued until one pint has been obtained. This is put aside until it is desired to prepare another quantity, when 16 troy ounces of drug is again taken, packed and macerated with the weak percolate, then *one pint* is obtained therefrom and constitutes the fluid extract. Another pint of weak percolate is obtained from this lot and set aside for future use. This method at first seems rather plausible, but upon second consideration will be condemned for its real inaccuracy.

Pressure.—It would necessarily consume much space and time to review verbatim here a published account of conducting this method. It occurs in Remington's Pharmacy, and I would suggest to those interested in this subject to give it a careful reading. Being familiar with the process in an experimental way, I must take serious exceptions to the assertion that this process can produce an acceptable extract. The sentence made use of under Fluid Extract Burdock, that "exhaustion by this process is not so complete as by one previously described, but is generally sufficiently so for practical purposes" is a loop hole that allows many a pharmaceutical problem to be easily solved.

To be more exact, issue is taken with the first method mentioned under the head of Fluid Extract Podophyllum where 100 pounds (we presume of 16 troy ounces each), of drug in No. 30 powder is taken, treated in the usual way until 120 pints of menstruum have been added, when percolation ceases; the drug is then taken, one-fifth at a time, placed under tremendous pressure, all contained liquid possible is obtained, put upon remaining drug, percolated, etc., as described.

Now mark—"The fluid expressed from the last portion, when added to the reserved portion" (not before mentioned), "which should be 95 pints, constitutes the fluid extract." Presumably the amount obtained in the last portion is but 5 pints; hence, allowing nothing for evaporation during exposure, 4 pints of menstruum was left after expression in each fifth portion—or say 16⅔% of menstruum used—hence, in order for the 100 pints to contain all the active constituents, the last 20 pints of menstruum added must contain *nothing*, and the first 100 must contain *all*.

Again, according to the deduction we quote, the last portion is pressed and 4 pints remain therein. Does not this 4 pints contain as much matter in solution as that obtained by pressing and which is necessary to complete the 100 pints? It certainly does. Hence the student would be forced to the conclusion that after all the process has no real advantage over single percolation carefully conducted, because, first, pressure to secure fresher menstruum for forcing ahead the preceding portion is parallel to adding new menstruum to the whole. Second, there is no great saving of menstruum, for here we note a loss of 20 pints, which, to be sure, may be mostly recovered by apparatus used in like operations.

The second method consists of placing in a macerator 100 lbs. of drug with 120 pints of menstruum, inverting macerator occasionally for ten days, then the drug is pressed out with the result of obtaining 80 pints of fluid (this leaving 40 pints of liquid of equal strength in the macerator). The drug is then broken up and more menstruum added (thus diluting the strength of the liquid contained therein), macerated a few days, pressed again, and sufficient fluid obtained to complete the 100 pints.

Now, what have we here? First, 100 lbs. of drug and 120 pints of menstruum, the whole menstruum equally saturated; we obtain finally, after adding more menstruum to pressed drug, but 100 pints of liquid. By what miracle do the substances dissolved in the original excess of 20 pints, and the menstruum subsequently added, get into the finished 100 pints? "Sufficiently exhausted," appears to be rather stretched in this connection, and I ask your opinions upon it. Practical experience in this field has satisfied me that these deductions are correct.

Maceration and Percolation in Vacuo.—This interesting method is now used to a limited extent by some of its enthusiastic supporters, and at one time it threatened to revolutionize the art of making fluid extracts, but while it is possible to prepare a fluid extract from the denser drugs without the use of more than 16 fluid ounces of menstruum to 16 troy ounces of drug, it is necessary to use more when treating the more bulky drugs, thus reducing it nearly to the plane of more simple processes which necessitate subsequent concentration or preservation of weak percolates for future operations.

Method of Dr. Squibb.—This method has been recognized as approaching more nearly to perfection than any previously conceived, and has certainly proven worthy of the wise mind that begot it. This being so familiar to all pharmaceutists, being an optional process of our pharmacopœia, extended comment in this connection is hardly necessary. However, it may be asserted that even in this process we have not perfection, as it necessitates the preserving of weak percolates, which, by most pharmaceutists, is considered a serious objection—a foothold for inaccuracy.

Before dismissing this subject of processes, allow me to present for your consideration and inspection a modification of the Squibb method of repercolation.

Modified Process of Repercolation.—The apparatus consists of four percolators of the later pattern, mounted with tubes and fittings substantially as prescribed by the pharmacopœia. The operation here shown [by drawings, which did not, however, accompany the author's paper] is the manufacture of two pints of fluid extract of Cascara Sagrada, and has been conducted as follows:

Eight troy ounces of the granulated drug (No. 30) was moistened with the menstruum, packed in percolator No. 1, sufficient menstruum being added to cover. After macerating two days, percolation was allowed to take place (more menstruum being added), until 12 fluid ounces of percolate had been obtained; now making no reserve (as in the Squibb method), this 12 fluid ounces is used in moistening, packing, and macerating No. 2. After two days, percolation is again allowed to proceed, procuring 20 fluid ounces from No. 2 to pack and macerate No. 3, then proceeding, after two days, as before, 28 fluid ounces of percolate is secured from No. 3 to pack and macerate No. 4, then after one day we are ready to continue the process to completion.

The percolators being then arranged so that each may discharge into the succeeding number, the new menstruum is added to No. 1, and the process continues. When 32 fluid-ounces of liquid shall have emerged from No. 4, the drug will be found completely exhausted and a perfect fluid extract results.

At first thought one is likely to criticise using a liquid so rich in dissolved matter for macerating new drug, and this is strengthened somewhat by the knowledge that solutions of many substances have different solvent powers from the original menstruum. But please notice that the amount of percolate obtained from each number is so regulated as to avoid a point near saturation and in practice its solvent power has not been found to interfere with the ultimate success of the operation. The great point gained in this process is perfect exhaustion, avoiding the necessity of preserving a weak percolate or subsequent evaporation.

A practical objection is the amount of extra menstruum necessarily used, but is this not more than over-balanced by the absence of weak percolate?

This is the first publication of this process and is commended for trial and comment by interested pharmaceutists.

Liquor Antihydrorrhoicus.

Brandau and Spener have obtained a patent upon a new compound which they call Liquor Antihydrorrhoicus, and which is said to be a very efficient remedy agaist foot-sweat. According to the patent specifications, it is prepared in the following manner:

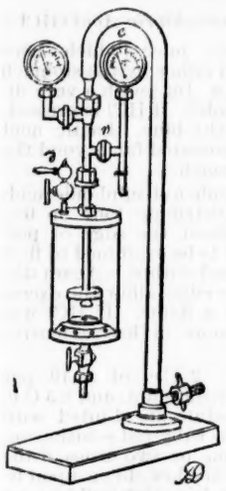
100 parts of butyrate and 100 of acetate of sodium are mixed with 160 parts of alcohol of 90 per cent, and 280 parts of concentrated sulphuric acid, and the mixture distilled. The vapors of ethyl butyrate and acetate are conducted into a glass globe having three tubulures, which is at first exposed to diffused daylight, but is afterwards protected against light. Through one of the other tubulures a measured current of chlorine gas is introduced. The third tubulure serves to connect the globular receiver with a flask containing a mixture of 3,760 parts of concentrated hydrochloric acid, 120 parts of alcohol of 90 per cent, and 120 parts of glycerin. The compound ethers, which are chlorinated in the receiver, descend into the acid mixture contained in the flask, in which they are dissolved. The whole product is finally colored red with litmus.

This solution—which seems to us rather problematical—is to be used undiluted as a bath to the soles of the feet. In case of very sensitive persons, it may be diluted. It is said to arrest the excessive sweating promptly and effectively.—After *Pharm. Centralh.*

Guaiacol is recommended by Sahli as preferable to creosote for internal use, owing to the uncertainty with regard to the purity of the latter. He proposes the following formula for its use: Guaiacol, 2 grammes; alcohol, 20 grammes; water, 180 grammes. Dose, a teaspoonful to a tablespoonful twice or thrice daily, after eating. The mixture should be kept in a bottle of black glass.—*Journ. de Pharm. d'Alsace-Lorraine; Amer. Journ. Pharm.*

COMBINED SUCTION AND PRESSURE PUMP.

A VERY compact and neat pump, suitable both for exhaustion and for pressure, and, besides, permitting an inspection of the working parts by their inclosure within a strong glass cylinder, has been constructed by Robert Muencke, of Berlin. It bears two gauges, one being for vacuum and the other for pressure. If any vessel is to be exhausted of air, this is connected by means of stout rubber tubing, with lower end of the tube coming from the vacuum gauge (*c*). At *v* there is a check-valve, to prevent the access of water. When the apparatus is to be used for pressure, as, for instance, when it is to furnish compressed air for a blow-pipe or blast-lamp, the stop-cock *d* is connected with the lamp. The faucet at the bottom of the cylinder serves to regulate the escape of the water.—*Chem. Zeit.* and *Chem. Centralbl.*



Muencke's combined suction and pressure pump.

Calamine Varieties.

There are few things more bewildering, and often inconvenient, than the many varieties of calamine in commerce, and the position is somewhat complicated by the urgent recommendation by each manufacturer of his own particular kind. Ranging through all colors from pink and red to gray and white, its composition seems correspondingly various. It is a question whether the employment [in English pharmacy] of pure carbonate of zinc in its place would not be attended with equally beneficial results; but some respect is due, perhaps, to time-honored prejudice. Moreover, it has been said, "in a multitude of councillors is wisdom," and perhaps the remark applies to the composition of this remedy. From a paper by A. R. Bennett on the subject, it appears that some samples are devoid of zinc. The qualities of a good calamine are its amorphous condition, freedom from silica, and presence of zinc. These conditions seem best fulfilled by the gray varieties.

Chloroform as a Preservative of Urine.

OF peculiar interest to the pharmacist is a communication of Prof. Salkowski to a Vienna medical journal on the use of chloroform for the preservation of samples of urine by the analyst. A 6-per-mille solution was found by him to effectively prevent the growth of micro-organisms, and he recommends it to be employed for keeping pathological liquids, and for the storage of anatomical preparations. Moreover, he suggests the employment of such a solution internally as a disinfectant and as a mouth-wash, and observes that it could be advantageously added to hypodermic injections. Salkowski's investigations confirm the principle upon which, by some manipulators, a little chloroform has been added to aqueous extracts of drugs, etc., to protect them from the growth of fungi and the effect of putrefactive change.—*Chem. and Drug.*

Refining Olive Oil without Chemicals.

ACCORDING to G. Seidel, olive oil is put into a conical tub provided with a steam-coil. About ¾ inch over the bottom, a faucet is inserted, to let off the water and impurities, and about 4 inches above this, a second faucet is placed for drawing off the oil. The tube or tank may be made of any desired size, but that described by Seidel holds about 2,000 pounds. It is placed upon a stone floor, and alongside of it are placed at different levels, 5 to 6 clarifying tanks resting upon strong wooden frames. These tanks, which may also be of tinned iron, have a cylindrical form, a false perforated bottom about 1 or 1½ inch above the bottom, and above this, at the side, a stop-cock. A layer of cotton, or preferably, glass-wool, is placed on the diaphragm.

Glass-wool is preferred as it may be easily washed and can be used for years, while cotton will last only for 2 or 3 operations. For every 100 lbs. of olive oil to be clarified, 10 to 15 lbs. of water are added. The oil is then brought to a boil, by means of steam, and kept so for 2 or 3 hours. It is then allowed to be at rest for 24 hours, during which time the water will separate. On opening the stop-cock the partially clarified oil is allowed to flow into the first clarifying tank. When this is full, its contents are allowed to flow into the second, and so forth. When the first tank is empty, it may be refilled from the steam tank as soon as a new lot of oil has been treated as described above.—*Industriebl.*

Carbonaphthilic Acid is said by the *Lyon Medical* to be about five times as powerful an antiseptic as salicylic acid, but very poisonous and insoluble.

WATER BLAST PUMP.

IT is well known that the principle which is applied to the construction of vacuum or filter-pumps, and which aims at the production of rarefied air in a certain inclosed space, may also be applied to the production of air-*pressure*.

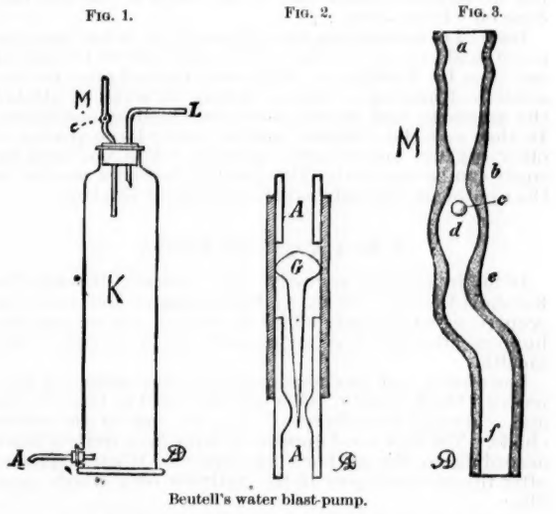
A simple apparatus by which this may be accomplished has recently been constructed by A. Beutell.

A tall cylindrical flask, *K* (see cut), is provided with an outlet tube near the bottom, and its stopper carries two tubes, one (*M*) for the entrance of a jet of water, and the other (*L*) for the exit of the compressed air, which may be conducted to a blast lamp or wherever air under pressure may be needed. The column of water entering through *M* causes air to be sucked in through the little hole at *c*, and this air, after arriving in the flask, is gradually compressed by the continuously entering water.

In order that the apparatus may work properly, it is necessary to construct the tube *M* in a particular manner, and of certain definite proportions. Figure 3 exhibits its bore and shape in an enlarged view. A short distance below the orifice of the tube it is slightly expanded, and then gradually contracts to the place *b*. It then again expands to an oblong cavity, and contracts again to a neck, *e*, which is a trifle wider than that at *b*, and which must be so situated that the column of water passing through *b* is exactly perpendicular to the centre of the aperture at *e*. The tube then expands again to its original diameter, and is slightly curved, which is done to prevent any of the compressed air in the cylinder *K* from regurgitating upwards.

The outlet tube at *A* is preferably constructed as shown in Fig. 2. Instead of being made of one piece, it is there represented as consisting of two pieces joined together by rubber tubing, a sort of check-valve, *G*, being introduced into the rubber joint. By regulating the check-valve, that is, by approaching it more or less to the exit of the tube *A*, the outflow of water may be regulated. It

FIG. 1. FIG. 2. FIG. 3.



Beutell's water blast-pump.

is important to adjust this so that the cylindrical flask will always be at least half-full, and never over three-fourths filled. While the column of water falls through the aperture at *b* into the expanded portion of *M*, it aspirates air through the little orifice *c*, communicating with the outer air, and this air is carried along with it into the flask, where it accumulates until it is under a pressure equal to that of the column of water entering the apparatus, when the latter will cease to flow. By allowing the air to escape through *L*, more will be successively compressed, so that a steady blast may be obtained.

The proportions between the diameters of the expanded and contracted portions of the glass-tube *M* are important. If the bore at *b* amounts to 2.5 millimeters, that at *e* should be 3 millimeters. Under these circumstances, and with a pressure of water equal to a column of 61.7 cubic centimeters, the apparatus will furnish 890 liters of air for every 1,000 liters of water consumed. If the two diameters were: *b*, 1 millimeter, and *e*, 2.4 mm., one liter of water aspirates 2.35 liters of air. These proportions are, no doubt, capable of improvement.—*Chem. Zeit.* and *Ch. Centralbl.*

Poisoning by Himrod's Powder.—Geo. Throp, in *The Lancet* of May 19th, mentions a case of poisoning by Himrod's Asthma Cure, where a stupid fellow mixed a teaspoonful with water and drank it without regarding the directions. Emetics were given, cold was applied to the head, and brandy given internally, and after a time his delirium and other toxic symptoms abated. The doctor attributed to copious draughts of lime-water much of the improvement that was secured.

Improvements in Revivifying Charcoal.

FROM a lengthy paper on "The Mode of using Charcoal in Sugar Refining," by Messrs. Newlands in the *Journ. of Soc. of Chem. Ind.*, we take the following passage, which gives some practical hints that may be applied to revivifying animal charcoal, even on the small scale.

Under certain circumstances, the calcic carbonate, carbon, iron, and other constituents increase to such an extent during long use [owing to the gradual waste of carbon during the process of reburning], as to render their reduction a matter of importance, and various means have been devised to attain this end. The treatment with dilute hydrochloric acid to convert the calcic carbonate into calcic chloride is the ordinary method adopted on the Continent in the beet-sugar factories, but this plan is open to the objection that a certain quantity of calcic phosphate is sure also to be decomposed, and that the framework of the charcoal will consequently be injured. To obviate this to some extent, it has been proposed to exhaust the air previous to the introduction of the acid, so as to bring the latter instantaneously in contact with every particle of the charcoal, and in this way equalize its action. To further overcome this difficulty, Beans used dry hydrochloric acid gas, which is said to have no action on calcic phosphate. Stenhouse and Duncan proposed to use dilute nitric acid in place of hydrochloric acid, and there is little doubt that it possesses advantages over the latter. Cook has suggested treating the charcoal with a solution of ammonic chloride, and then reburning so as to produce ammonium carbonate which goes off, and calcic carbonate which is afterwards dissolved out. Cook also patented the use of phosphoric acid to decompose the calcic carbonate. Patrick, Beans, and others have proposed to dissolve out the calcic carbonate by means of a saturated solution of carbonic acid. In English refineries, the calcic carbonate, in all cases, so far as we can ascertain, decreases during use, and this appears to be due to the employment of cane sugar, which is generally slightly acid. It has been proposed to reduce the carbon by reburning the charcoal after it has been saturated with a solution of ammonic nitrate, but we have not been able to ascertain if this has been done on a large scale. . . .

Instead of revivifying by carbonization, it has been proposed (and to some extent carried into effect) by Eisfeld, and also by Phillips, to digest the charcoal after use in a solution of ammonia, potash, or soda in water or alcohol, the ammonia and alcohol been recovered by distillation. In this way the coloring matters and a large portion of other organic and mineral matters taken up from the sugar can be removed. This process has been worked on the Continent, but only experimentally in England.

A New Vegetable Rennet.

IN his interesting narrative of a journey through the Kalahari Desert,* Mr. G. A. Farini relates the following occurrence which may afford to some of our enterprising hunters after novelties an opportunity to exercise their faculties.

The author and his companions had been attended by a native "black beauty," who had been sent to him as cook and "general housekeeper," etc., by one of the native chiefs. The first meal appears to have been quite a feast, according to the author's description. What happened after this we shall give in the author's own words (page 216):

"When we had finished it was her ladyship's turn to eat. Her despondent state had not affected her appetite, for she consumed enough for three men, washing down the hearty repast by drinking a small calabash of milk, which only a few minutes before had been brought in fresh from the cow, but which was now quite thick. This astonished me, for I knew that the thick milk which all Kaffirs prize so highly takes some time to get ready—at least among the Zulus, who prepare it by filling skins, which already contain a certain amount of 'leaven,' with fresh milk, and subjecting them to considerable agitation. What necromancy had been employed to 'turn' the milk so soon in this case? Had the Black Beauty's sour temper effected the change? I tried to ask by means of pantomime, but could not make them understand; they thought I asked for more milk, and sent for a fresh supply, which came in a quarter of an hour, the froth still on it, quite fresh from the cow. Seeing a little thick milk still left in the calabash, I pointed to it and then to the new. Now they understood, and one of the Abigails went out and brought in two little berries, about the size of a red currant, and nearly the same color, but not quite so bright. Taking them between her thumb and finger, she pricked them and squeezed a drop or two of greenish fluid out of each, letting it fall into the new milk. In less than half a minute it was quite thick, but still remained perfectly sweet. The berry itself had a peculiar bitter flavor. It grows on a low prickly bush, not unlike a rose bush, some of the seeds of which I secured, thinking this Kaffir substitute for rennet might be useful in Europe."

* "Through the Kalahari Desert. A Narrative of a Journey with Gun, Camera and Note-Book, to Lake N'gami and Back." By G. A. Farini. 8vo, London, 1886.

Reagents for Detecting Free Acids in the Stomach.

MUCH attention has recently been bestowed upon the nature and quantity of free acids in the stomach, as their kind, presence or absence has been recognized to be a characteristic of certain diseases. The pharmacist is frequently called upon by the physician for information or assistance in the execution of the tests, and for this reason the following synopsis, originally outlined by Dr. Boas, of Berlin, and taken from the *Pharm. Zeitung* (1888, pp. 343), will be of practical interest:

A. *Reagents for Detecting Free Hydrochloric Acid* (HCl.).

1. *Methyl-violet.*—Mix the gastric juice [which here and in other cases may be obtained either by the stomach pump or in any other way.—ED. AM. DR.] with a very dilute aqueous solution of methyl-violet. If HCl is present, the tint will change to azure or sky-blue. Lactic acid produces this tint only when concentrated far beyond the limit which it can reach in the stomach.

2. *Tropæolin* 00 (oxynaphthyl-azophenyl-sulphonic acid) in saturated alcoholic solution. Distribute four or five drops of this by brisk agitation about the edge of porcelain capsule, and allow the liquid to be examined to flow over it in drops and to become mixed with it. Again distribute the whole mixture about the edge, allow the excess to flow off, and warm gently over a flame. If HCl was present, there will be produced more or less extensive violet to lilac spots.

3. *Rheach's* or *Mohr's Reagent.* 2 C.c. of a 10 per cent solution of sulphocyanide of potassium, and 0.5 C.c. of a neutral solution of ferric acetate are diluted with water to 10 C.c. A few drops of this ruby-red solution are put into a porcelain capsule, and one or two drops of the liquid to be tested is then allowed to flow down upon it. If HCl is present, a faint violet or lilac tint will form at the point of contact, becoming mahogany-brown on mixing the liquid.

4. *Günzburg's Reagent.*—2 Gm. of phloroglucin and 1 Gm. of vanillin are dissolved in 30 Gm. of alcohol. A drop of this solution and a trace of mineral acid produce a bright-red liquid and precipitate. When testing gastric juice, a few drops of the latter (previously filtered) and a few drops of the reagent are mixed in a small flat capsule, and the latter cautiously warmed over a flame. If HCl (even only about 0.05 per cent) is present, a bright-red circle will appear at the outer rim.

5. *Coloring Matter from Huckleberries* (*Bilberries*). (Uffelmann).—If freshly-expressed huckleberry juice is extracted with amylic alcohol, the latter assumes a reddish-blue color, which becomes lilac on addition of HCl, while the aqueous layer has a bright currant-red color. On repeatedly saturating blotting paper with the amylic solution, a grayish-blue reagent paper is finally obtained, which assumes a fine red color with HCl, the color remaining upon the addition of ether. Lactic and butyric acids produce this reaction only when present in larger quantity than 4 to 4.5 per 1,000; acetic acid only at 6 per 1,000.

6. *Malachite-Green* (Koester).—A solution of malachite green containing 0.025 per cent forms a bluish-green liquid, which is colored bright emerald green by HCl. Below 0.05 per cent HCl, the reaction is feeble. Organic acids do not alter the tint.

7. "*Emerald-Green*" (extra crystallized) (Jaksch).—Aqueous solutions of this coloring matter (water soluble; blue variety) are turned green by HCl, even when dilute. (Butyric, acetic, and lactic acids do not change the original color even in concentrated solution.)

8. *Tropæolin-Paper.*—This is same reagent as No. 2, only in form of test-paper.

9. *Congo-Paper.*—Paper tinted with Congo red is turned blue (according to Riegel) in presence of free HCl.

B. *Reagents for Detecting Free Lactic Acid.*

10. *Uffelmann's Reagent.*—Mix 10 C.c. of a 4-per-cent solution of carbolic acid with 20 C.c. of water, and add a few drops of solution of ferric chloride. The amethyst-blue color is changed even by very small quantities of lactic acid into bright yellow (canary yellow). The reagent must always be prepared fresh.

11. *Ferric Chloride.*—Add a few drops of dilute solution of chloride of iron to 50 C.c. of water. The resulting liquid should have not more than a faintly yellowish tint. Addition of diluted HCl, or butyric or acetic acids does not change this; but free lactic acid or lactates turn it more or less yellow.

[The original adds a method of detecting and isolating butyric and lactic acids. But this method is practically useless, and therefore omitted here.—ED. AM. DR.]

The New Austrian Pharmacopœia will appear in December next. The pharmacognosy section is being compiled by Professor Vogl; the chemical section, from A to K, by Professor Ludwig, and from K to Z by Professor Barth; while Mr. M. R. Schneider will edit the whole. The authors are very reluctant to give any details about the progress of the work.

IODOFORM AND OTHER PENCILS.

On page 39 of our volume for 1887, we described a class of remedies introduced by Dr. Unna under the name of pencils or *stylus dilubilis*, and gave a variety of formulas therefor. Mr. H. Hebling, of the German Hospital, London, in a paper published in the *British and Colonial Druggist*, offers some modifications based upon his experience in making them in considerable quantities. Dr. Unna's formula provides for the use of starch, dextrin, sugar and tragacanth as a base. Mr. Hebling says:

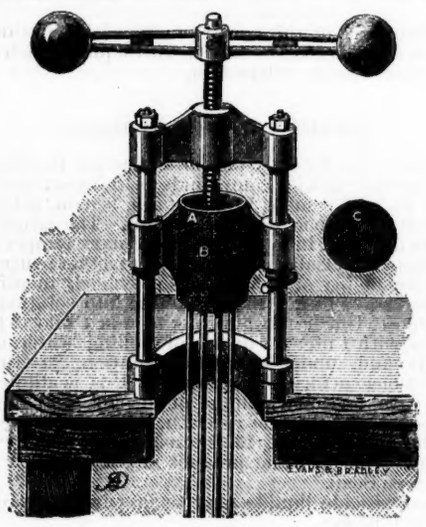
I have used two different kinds of base. The first, made up of gelatin, glycerin and water, is prepared as follows:

Take of

Best Gelatin	10 oz.
Best Glycerin	16 oz.
Water	q. s.

The gelatin is dissolved in water and glycerin by the aid of a water-bath in a porcelain dish, the water lost by evaporation being compensated for, by addition of more. The ingredients, if not soluble in water, are mixed in a finely-powdered condition with the warm and tenacious glue, which is poured into moulds similar to those used for making caustic, previously moistened with oil or soap liniment. When cold the pencils are quite elastic, but not sticky, and they do not adhere to the skin.

In a previous article the base was recommended for such ingredients as zinc oxide, salicylic acid, and as a dressing in cases of eczema. Since then Dr. F. A. Phillipi, M.D., of the German Hospital, and Dr. Unna, have both called attention to "zinc-glue" at the Conference of the British



Apparatus for making Pill or Pencil "Pipes."

Medical Association held in Dublin. Dr. Phillipi reported on its use in the treatment of 40 cases of ulcer of different kinds, of which 25 were cured by this preparation, and I can recommend zinc-glue to the readers of this diary as a dressing, which, if offered to doctors, will certainly give them every satisfaction.

The second way of preparing these sticks, which is quite familiar, consists of making use of cacao butter as the base. The fat is melted and allowed to half cool. At this point the various medicinal agents are introduced and reduced to fine powders if insoluble, or if soluble, like salol, betol, etc., simply added, and the whole poured into appropriate moulds. These kinds of pencils are, of course, not flexible.

When one has a large number to prepare, the operation outlined above, occupies a very long time—more, indeed, than it is often possible to spare. Recognizing this advantage, I began to cast about for some more rapid method of working, and finally hit upon the following. I may say that it admits of both kinds of sticks being prepared, on the large scale, with surprising rapidity, and essentially consists in abandoning the process of melting the basis, resorting instead to dry pressure. A simple machine is required which I illustrate above.

It is an apparatus which I also use for the piping of pill masses by pressure. The illustration is so clear as to render explanation superfluous.

The mode of procedure is very simple. The piston B is removed, and the prepared mass filled into the cylinder A. The cylinder being replaced is screwed down on to the contents of A, which are forced through the orifices in the plate C. This I have had in my machine so constructed that it is perforated with two holes having a diameter of $\frac{3}{16}$ of an inch, and an equal number with a diameter of $\frac{3}{16}$. I have also an iron plug for each of the orifices, by means of which any one of them can be filled up, according to the size of the pencils it is desired to make. The plate C being movable, can be replaced by any other of the same size and shape, which may be bored of a suitable size for the preparation of suppositories, etc.

For elastic pencils I use a mass consisting of dextrin, sugar, starch, and tragacanth, with which the ingredients are well mixed and beaten, with the addition of a little water and glycerin, to a very hard but plastic mass. The formulæ are as follows:

Iodoform Pencils, 33 per cent.

℞ Iodoformi	3 i.
Amyli	3 iij.
Tragacanthæ	3 i.
Dextrini	3 i.
Sacch. alb.	ʒ ss.
Aq. et Glycer.	ãã q.s.

Salicylic Acid Pencils, 5 per cent.

℞ Acidi Salicyl.	3 i.
Tragacanthæ	3 i.
Amyli	3 i.
Dextrini	3 vij.
Sacch. Alb.	3 iij.
Aq. et Glycer.	ãã q.s.

When the masses are pressed, the pipes should be cut into pieces of about 3 inches in length, and may be polished, if necessary, by rolling on a porcelain slab with a thin board.

The method of preparing the cacao butter pencils is still more simple. The fat is first powdered, or, what is easier, comminuted by the use of an ordinary grater. It is then mixed with the ingredients. With this base elegant preparations may be obtained, which will give satisfaction to any one. The formulæ I use are:

Iodoform Pencils, 33 per cent.

℞ Iodoformi pulv.	1 part.
Ol. Theobromatis	2 parts.

Cocaine Pencils, 2 per cent.

℞ Cocainæ Muriat.	1 part.
Ol. Theobromatis	49 parts.

To be cut into pieces so that each one contains ½ gr. of cocaine salt.

Salol Pencils, 20 per cent.

℞ Salol	1 part.
Ol. Theobromatis	4 parts.

Dissolve the salol in the liquid oil, and after cooling with constant stirring, powder the mass, and treat as above described.

Opium Pencils, 5 per cent.

℞ Pulv. Opii.	1 part.
Ol. Theobromatis	19 parts.

To be divided into 1 gr. sticks.

Thalline Pencils, 5 per cent, for Gonorrhœa.

℞ Thallin. Sulph.	1 part.
Ol. Theobromatis	19 parts.

Mercurial Pencils for Syphilitic Fistula, 25 per cent.

℞ Ung. Hydrarg.,	
Ceræ Alb.	Æq. partes.

Melt the wax. When half cool add the ointment, and allow to solidify, with constant stirring. Then press as above described.

Syrup of Lactophosphate of Calcium.

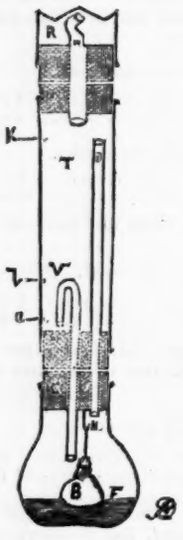
In answer to Query No. 19, *What is the best process for making Syrup of Calcium Lactophosphate*, Mr. John J. Buehler read a paper before the Ohio State Pharm. Association, in which he reported, that the following formula and process for making the above syrup, while not differing much from the U. S. P. formula, has been found to be the most satisfactory of many that have been tried.

Lactic Acid	19 fluid drachms.
Ppt. Phosphate of Calcium	2 oz. avoird.
Gran. Sugar	3½ lbs.
Hydrochloric Acid,	
Aqua Ammonia,	
Water,	
Distilled Water	ãã q. s.
Glycerin	5%

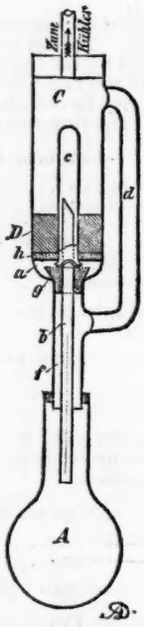
Mix the Calcium Phosphate with 1½ pints of water, in ½ gallon bottle, to which add sufficient Hydrochloric Acid (about 3½ oz.) to dissolve. Transfer to an open crock (2 gallon) and add water q. s. to bring up the volume to about six pints. Add to this an excess of Water of Ammonia (about 5 oz.) to precipitate, stirring with a wood spatula or glass rod. Throw the mixture in a muslin strainer, tied over an open crock; when well drained mix the magma once more with 6 pints water and strain again, then add to the moist magma the Lactic Acid, dissolve and add enough distilled water to bring the volume to 34 fluidounces, add the sugar, dissolve by agitation. When dissolved, add the glycerin.

IMPROVED EXTRACTION APPARATUSES.

THE apparatus consists of a flask, F, of about 220 C.c. capacity, into which fits tightly a sound cork C, pierced with two holes. Underneath, and in the centre of the cork C is fixed a small hook H (pin bent round will do very well); to this hook H is suspended, by means of a platinum wire, a small cotton bag, B, which contains the substance to be operated upon. On the top of this flask is a tube, T, about 7 inches long and 1¼ inches in diameter; at each end of this tube is fitted a good sound cork, S and P; the cork S is pierced with two holes, similar in size and position to the holes in the cork C. The holes in these two corks are best made by placing the corks together, end to end, and boring through both corks simultaneously. Into the larger of the holes in S is pushed the tube D, about 6½ inches in length and 1¼ inches in diameter (internal), and through the small hole in S is pushed the siphon tube V, which is about ⅛ inch internal diameter, and which has been previously bent round in the manner shown; the cork S is now pushed tightly into the end of T; at the top of this tube is fitted another cork P, which is pierced with a hole in the centre; through this hole the tube W passes into the condenser, R.



Barlow's apparatus.



Schmidt and Hœnsch's apparatus.

When operating I take from 3 to 6 Gm. of the substance, place on a piece of good calico, about 5 inches square (which has been previously well cleaned by boiling in a dilute solution of sodium carbonate, afterwards in water, dried and weighed); the substance is tied up in this by means of a platinum wire, and then suspended to the hook H; then about 120 C.c. of ether are placed in F, the cork C pushed in tight, with bag underneath; the bottom of the bag must be at least ½ inch from the bottom of the flask. The tube T is now fixed to the condenser R, by pushing the tube W through the hole in the cork P; then the flask is fitted to T by pushing it on to the tubes V and D, the cork C fitting closely up to the cork S; the tube D must only just pass through C, and the tube V much lower. The whole apparatus is now lowered, so that F is immersed in a large beaker or other suitable vessel of water, kept at the temperature of boiling ether. When the ether boils its vapor rises up through the tube D into the condensing tube W, flows back down W, when condensed, into the tube T, where it accumulates until it gets to the bend of the tube V at *b*, when it will siphon back into the flask, and so on *ad libitum*. After about two hours, the beaker of hot water may be removed, and the flask, with corks C and S, and the tubes D and V, taken from tube T; tube V is removed, and then replaced by a larger one, which reaches up to the point K. The apparatus is again connected, and the distillation carried on till the ether fills the tube T to the point K. The flask is now slipped off C, the bag taken from the hook H, and both flask and bag placed in the air-bath, and dried at a temperature of 220° F., until weight is constant. The weight of the flask and its contents, minus the weight of the flask, gives the weight of the oil extracted. The contents of the bag are ready for operating on to obtain indigestible fibre, mineral matter, etc.

The advantages claimed for this arrangement are: 1st, that the tube T, with its fittings, acts precisely as in a delicately made Soxhlet tube, but is not so liable to fracture, is less costly, and can be easily fitted up out of loose material found in most laboratories; 2d, the substance operated upon is always subject to the action of boiling ether or ether vapor—a point of great importance with some substances—instead of only cold ether, as in other arrangements; 3d, that, by means of using a larger siphon tube, after the oil extraction, nearly all the ether can be distilled off and recovered at one operation, and the whole extraction done in much less time than with cold ether, and with very little loss."—JOHN J. BARLOW, *Chem. News*, Feb. 10th, 1888.

F. SCHMIDT AND HAENSCH, of Berlin, have patented the extraction apparatus here described, which has several advantages.

The extractor proper is a rather wide tube *C*, ending in a somewhat narrower one, and having a lateral tube for conveying the vapors. At *g*, a cork is inserted, and through this passes the tube *b*, the upper end of which is obliquely cut off. Over this end is inverted another tube closed at one end (a test-tube will answer), the rim of which is provided with dents, made by softening it in the flame and indenting it at several places of the circumference. At *a* finely perforated metallic disk is inserted. This is covered by a piece of felt *h*, and upon this is placed the powder, etc., to be extracted. The tube *b* must be adjusted at such a height that the lowest point of the obliquely cut-off end is on a level with the surface of the powder.

When the extractor has been fitted into the flask (which is charged with ether, or another volatile liquid), and the condenser attached above, heat is applied, which causes the vapors to rise through *d*. Being condensed in the cooler, they fall back upon the powder which they penetrate. The saturated liquid gradually rises through the dents of the tube *c* until it finds an outlet through the tube *b*.

The advantage of this construction consists in this, that the powder is constantly covered with liquid, which causes a much more speedy exhaustion.

Naphtalin as Insect Destroyer.

H. HAGER has recently put in a plea for the abandonment of arsenic and its compounds as an insect destroyer, and for its replacement by naphtalin, benzin, petroleum, disulphide of carbon and chloroform. The latter liquid (which is not itself inflammable at ordinary temperatures) is capable of materially reducing or altogether neutralizing the inflammability of the 3 liquids previously mentioned.

It is necessary to get the naphtalin into solution. For this purpose, Hager recommends to mix 1 kilo (2 lbs.) of soft soap with 1 liter (1 quart) of boiling water, and to gradually add, under energetic agitation, 20 Gm. (300 grains) of oleic acid. If a sample of this is diluted and shaken with an equal volume of alcohol, and if it then still possesses an alkaline reaction, a little more oleic acid should be added, 10 Gm. (150 grains) being probably amply sufficient. The resulting product might be called "Mitigated Green Soap."

The parasiticide liquids may be prepared, according to Hager, as follows:

1. *Liquor Naphtalini Benzinatus.*

Naphtalin	40 parts.
Chloroform	80 "
Benzin	100 "

Mix at a temperature between 18° and 20° C. about 64-68° F.), and shake until solution has been effected.

2. *Liquor Naphtalini Sulpho-carbonatus.*

Naphtalin	20 parts.
Chloroform	50 "
Disulphide of Carbon	30 "

Prepare like No. 1.

For use in a *liquid* form, either of these liquids is to be properly diluted, the following being a good formula:

Common Family Soap, dry	25 parts.
Castile Soap, dry	25 "
Water	900 "
Alcohol (90%)	450 "
"Liquor Naphtalini Benzinatus"	150 "

Dissolve the soaps in the water and alcohol previously mixed, allow the liquid to become cold, and then add the naphtalin solution. Before using the liquid, shake it thoroughly.

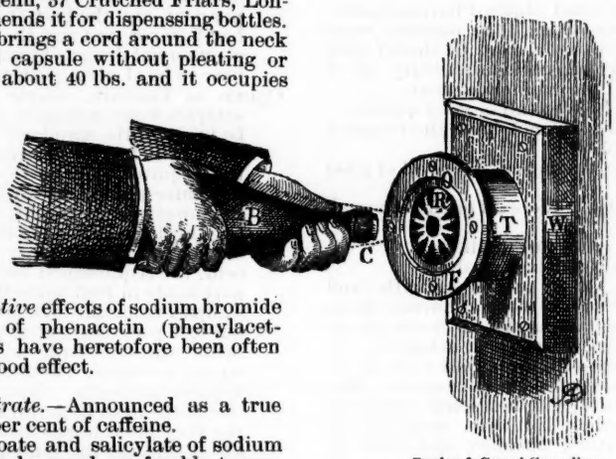
If an *ointment* is required, 85 parts of vaselin and 15 parts of ceresin are melted together and before the mass sets, 200 parts of the liquor naphtalini benzinatus mixed with it.

If either of these is to be used as a parasiticide upon animals, it should be applied with a stiff brush, in quantity only large enough to moisten the skin or to render the hair or fur slightly glossy. Under all circumstances is it preferable to avoid using these compounds at night time, as accidents may occur by approach to or contact with flames.—Abstract fr. *Ph. Zeit.*, 1888, p. 160.

BOTTLE-CAPSULING APPARATUS.

AN ingenious contrivance for affixing metal capsules to small bottles is shown in the adjoining illustration. It is the invention of Zugler & Gross, and is said to be managed with ease by boys or girls. The tube T is fastened in a block of wood W, which can be screwed on the wall or door, etc. (about one yard above the floor). Into the opening O of this tube an india-rubber ring R is inserted, being fixed by the flange F. To use this apparatus place the capsule C slightly over the cork of the bottle B, then push the top of the bottle into the centre of the india-rubber ring, turn the bottle once or twice, and the capsule will be nicely fixed on the bottle.—*Br. and Col. Drug.*

ANOTHER capsuling apparatus of more elaborate character and costing about $11.00 in England is called the "Simplex." The proprietor, C. Melin, 37 Crutched Friars, London, E. C., specially recommends it for dispenssing bottles. "A single pull on the lever brings a cord around the neck of the bottle and affixes the capsule without pleating or creasing it." Its weight is about 40 lbs. and it occupies 18x20 inches of space.



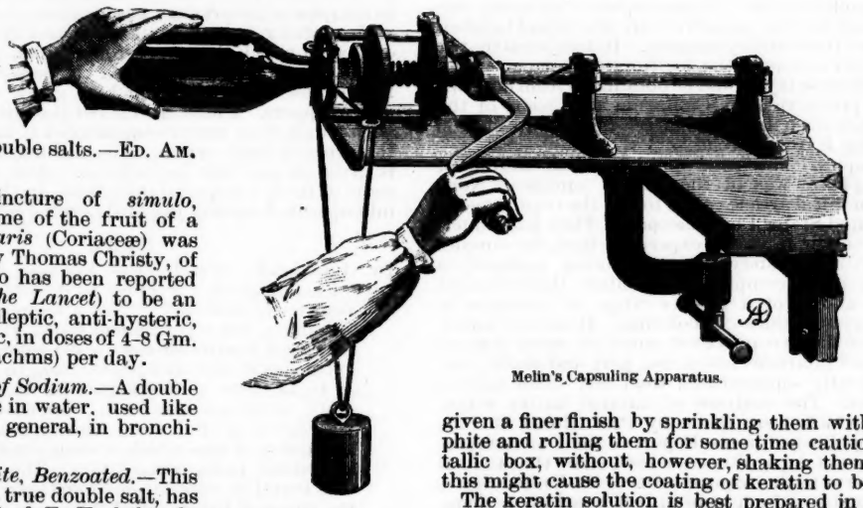
Zugler & Gross' Capsuling Apparatus.

Notes on New Remedies.

Mono-brom-phenyl-acetamide.—This compound ($C_6H_4Br.NH.C_2H_3O$), which was first prepared by Cheyne in England, is supposed to combine the *sedative* effects of sodium bromide and the *antifebrile* effects of phenacetin (phenylacetamine), which two remedies have heretofore been often given in combination with good effect.

Caffeine and Sodium Citrate.—Announced as a true double salt, containing 52.5 per cent of caffeine.

[As in the case of the benzoate and salicylate of sodium and caffeine, it will probably be much preferable to prepare a compound containing just 50 per cent of caffeine, as it will be almost impossible for the physician to remember the varying percentages of caffeine of the so-called true double salts.—ED. AM. DRUGG.]


Melin's Capsuling Apparatus.

Simulo.—A tincture of *simulo*, which is the name of the fruit of a species of *Capparis* (Coriaceæ) was first prepared by Thomas Christy, of London. Simulo has been reported by White (in *The Lancet*) to be an excellent anti-epileptic, anti-hysteric, and nervine tonic, in doses of 4–8 Gm. (ab. 1 to 2 fluidrachms) per day.

Citrobenzoate of Sodium.—A double salt, very soluble in water, used like the benzoates in general, in bronchitis, asthma, etc.

Sodium Sulphite, Benzoated.—This compound, not a true double salt, has been found by Prof. E. Heckel to be a most powerful and non-poisonous surgical antiseptic. It is readily soluble in water, but unstable. Heckel asserts that it is ten times as powerful as iodoform, and fully equal to mercurial salts, over which it possesses the advantage of being non-poisonous.—From *Merck's Bulletin.*

Meconarceine.

THIS is the name of a preparation, devised by Dr. Laborde, who declares that it contains narceine and a few other alkaloids of opium, but is free from morphine. It has long been known that narceine is a narcotic alkaloid free from the objectionable properties of opium. But its difficult solubility rendered its practical employment almost impossible. Dr. Laborde now claims to have solved the problem, but the announcement smacks much of proprietary rights, or nostrum. The new substance is said to be a definite alkaloidal product from opium, given internally, in pills, in doses of $\frac{1}{12}$ grain, and subcutaneously in solution so that one injection contains about $\frac{1}{2}$ grain.

Caffeine from Damaged Tea.—At a recent meeting of the London Chamber of Commerce it was alleged that 3,000 to 4,000 lbs. of caffeine were made annually in Germany, mainly from damaged tea which is rejected in British custom houses. Messrs. Thomas Christy & T. P. Moran were appointed a committee to endeavor to receive admission of damaged tea under conditions which would prevent its use as a beverage, but would not interfere with the extraction of the alkaloid.

Keratinized Pills.

SOME practical hints regarding the preparation of pills coated with keratin, which are intended to pass the stomach undigested and to be dissolved in the upper part of the intestinal canal, are given by Mr. Kippenberger in the *Pharm. Zeitung* (June 6th) as follows:

It is not sufficient to coat the pills with keratin, since each pill, on passing through the stomach, would absorb a certain amount of moisture through the coating of keratin, and thereby swell up. For this reason, the pills are made with the aid of a fatty excipient, and are afterwards coated with fat of such a nature that not only the coating but also the pill-mass will soften, but not melt at the temperature of the body, the softening process or solution not taking place until after they have passed beyond the stomach. A very good combination for this purpose is either of the following:

	parts.	
Suet	10	3
Wax	1	–
Cacao Butter	–	2

Care should be taken to avoid the presence in the pills of any substance which easily swells up or is damp. If its constituents are such that they require much stiffening, the best substances to accomplish this are bole, powered charcoal, kaolin, gum arabic or tragacanth. The coating with fat must be done with special care, since each defect in the coating will cause the pill to burst in the stomach during digestion. The fat-coated pills are rolled in powdered graphite, which is, however, not necessary, and is only done to give a better appearance to the pills. Next they receive two successive coatings of keratin solution—either plain aqueous or prepared with acetic acid or with ammonia (see below)—and rolled in a flat capsule until they are dry. They may be given a finer finish by sprinkling them with a little graphite and rolling them for some time cautiously in a metallic box, without, however, shaking them strongly, as this might cause the coating of keratin to become broken.

The keratin solution is best prepared in the following manner. Shavings of horn are deprived of fat [by extraction with benzin, etc.], and are then subjected to artificial digestion with pepsin, hydrochloric acid, and water, in order to remove those bodies which would reduce the keratin coating during digestion in the stomach. The remaining shavings are washed, and then digested in dilute water of ammonia, at a gentle heat, until solution has taken place as far as possible. The liquid is then filtered, and the filtrate evaporated to dryness. The residue is eventually dissolved in glacial acetic acid, in the proportion of 1 in 10, or in a mixture of equal parts of water of ammonia and diluted alcohol.

The ammonia solution of keratin dries more rapidly than the others. Equal parts of the acetic and ammoniacal solution may also be mixed and applied to the pills.

Note on Phosphoric Acid Estimation.

WHEN phosphoric acid is determined or separated, analytically, by means of ammoniacal solution of chloride of ammonium and sulphate (or chloride) of magnesium, the resulting crystalline precipitate of ammonio-magnesium phosphate usually adheres with considerable tenacity to the sides of the beaker and to the glass rod (if one is present). According to Stutzer, this may be avoided by adding to the liquid, before it is stirred, a few shreds of chemically pure, ash-free filtering-paper (Schleicher & Schuell's). Upon these shreds almost all of the crystals are formed. These shreds are prepared by agitating pieces of the filtering-paper in a bottle with water of ammonia, so as to produce a thick magma.—*Chem. Zeit.*

Drug Adulteration and Alcoholic Nostrums.

DR. BENNETT F. DAVENPORT, one of the analysts of the State of Massachusetts, reports the following results of his examinations of articles collected in the drug trade during the preceding year.

Potassium Bitartrate, 37 samples. Were all of standard quality except two. One of these had about 60 per cent of lime sulphate, and the other nearly as much of acid phosphate of lime and starch.

Potassium Iodide, 15 samples. All but one had an excess of chlorides and of carbonates.

Oils, of the fixed and volatile mentioned in the United States Pharmacopœia, 93 samples. Of these all but 13 were of their proper quality.

Jalap, 15 samples. All but 2 fairly contained the required amount of total resin and of that not soluble in ether.

Powdered samples of the United States Pharmacopœia, spices and other vegetable drugs, 66 in number, were submitted to microscopic examination. Of these 7 were found to contain foreign ingredients; nearly all of them were mustard, and the adulterant flour.

Chloral Hydrate, 15 samples. Were all of good quality.

Pepsin, 6 samples; of which 3 did not have the required amount of digestive activity.

Iron, Saccharated Carbonate, 9 samples. Were all of good quality.

Bismuth Subnitrate, 5 samples. Were all of correct quality.

Glycerin, 7 samples. Were all of fair quality.

Menthol, 4 samples. Were of standard quality.

Alcohol, 6 samples. Were all of proper strength, and agreed as well with the United States Pharmacopœia tests for foreign organic impurities as could be expected from the customary storage of it in barrels.

Whiskey, 4 samples. But one of these agreed with the requirements of the United States Pharmacopœia—that is, was the straight, natural distilled spirit, mellowed only by time. All the others had been submitted to the processes of the mixers, blenders and other so-called improvers, who are miscalled rectifiers, at least in the ordinary meaning of the term.

Brandy, 16 samples. Not one of them was the natural article demanded by the Pharmacopœia, but every one of them had met the misadventure which had befallen the most of the whiskey samples. It does seem that at least enough to supply the legitimate pharmaceutical needs of the country should be obtainable from our own domestic production in California and some of the other States, even if there is no reasonable expectation of obtaining it from abroad.

Wine, 12 samples. The same was true of all but one of these samples as was of the brandy samples. None were the natural article called for by the requirements of the United States Pharmacopœia. They had undergone an even more varied experience than the samples of whiskey and brandy; for, wine being naturally a fluid of a more complex composition than distilled spirits, it allows of a greater range of variation in other respects besides the coloring. It is very unfortunate that the two imported wines in most general medical and pharmaceutical use, port and sherry, are more generally sophisticated than any other sold in our market. The analyses of natural native wines, however, which were made by Prof. Henry B. Parsons, and published in the Report of the United States Department of Agriculture for 1880, show that they at least conform to the requirements of the United States Pharmacopœia, which were in fact based upon them. That the ordinary manufactured wines are likely to prove any more injurious to the health of consumers than would natural wines, has not yet, I think, been fairly demonstrated. Yet to sell them for natural wines is none the less a fraud.

Spirits of Nitrous Ether. Fourteen samples have been examined, and only two of them were found to fairly contain the required percentage of ethyl nitrite. From some of them it was well-nigh totally absent. Probably this was largely due to the improper manner in which the preparation is commonly stored, as was mentioned in my last report.

Compound Spirits of Ether. Thirteen samples have been examined and 5 of them found to fairly contain the required amount of heavy ethereal oil. This is a much larger proportion than was found in any previous year.

Tincture of Nux Vomica. Thirty samples were examined, and only 6 of them were found to have just the proper amount of 2 per cent of extract. They ranged from 0.92 per cent to 5.81 per cent of extract, one thus being over six times as strong as another. There were 15 of them above and 9 below the proper strength. Their average was 2.24 per cent. This is a preparation for which there is no valid excuse for any essential variation from the exact amount, when one considers its method of preparation; for if the very simple directions of the Pharmacopœia are followed, the desired definite result will be secured.

Quinine and its Sulphates. Forty samples were examined, and all were found to be fairly within the Pharmacopœial requirements of purity.

Citrate of Iron and Quinine. Thirty-eight samples were examined, and all but 3 were found to be fairly up to the standard required for percentage of alkaloid. This is a very great improvement over what has been found in previous years, when about three-fourths of the samples have been found to be deficient in the alkaloid. The general substitution of the unofficinal ammonia form of the preparation, however, continues, as it should not.

Opium in the forms of Gum, Powder and Pill. Twenty-seven samples were examined, and all but 2 were found to fairly contain the Pharmacopœial amount of morphine. In no previous year have many more than half of the samples been found to be up to the standard. Thus there has been a very great improvement in regard to this very important drug. The poorest yield of morphine in any sample of powder has been 11.40 per cent, and the best 14.76 per cent. The poorest gum had 9.50 per cent and the best had 13.80 per cent. The commercial drug as found sold in this State thus seems now to be of very good quality.

Opium as Tincture, simple and deodorized. Forty-two samples were examined, and but 9 were found not to be fairly of the standard quality. In no previous year have quite half of the samples been found to be up to the required standard. The highest percentage of morphine yielded by any sample was 1.59 per cent, and the lowest 0.58 per cent, which was thus only about one-third as much as in the highest, and less than half of the required amount. Their average was 1.24 per cent, the requirement being 1.20 per cent. In my report made in 1883 upon the first general collection of samples made throughout the State, the average was but 0.96 per cent, and 82 per cent of the samples fell below the standard, while some were six times as strong as others, which were only about one-fourth the required strength. Thus in this preparation, which is one of the most important of all those used in medicine, the very great improvement which has been brought about through the influence of our State adulteration law is made very manifest.

Besides the above-mentioned Pharmacopœial drugs and their preparations, I have examined the following list of 50 samples of proprietary preparations, tonics, and bitters, with special reference to the relation which the percentage of alcohol which they were found upon assay to contain might bear to the admission of the presence of any claims for the absence of all alcohol, as given upon their labels and wrappers. I have also noted the doses and frequency with which they were recommended to be used, as well as the place of their origin. The alcohol found upon assay is given in per cent by volume. How far the claim of some of them for special usefulness in the reformation of intemperate habits is justified is self-evident.

Tonics.

Dr. Buckland's Scotch Oats Essence, New York City. "Enough alcohol is added to dissolve resins, and prevent fermentation." "Not a temporary and fleeting stimulant, but a permanent tonic. Its use must be regular and continued over a considerable period. An extract of double and triple strength also made. Dose, 10 to 15 drops to a teaspoonful three or four times daily, increased as needed." In the simple essence 35 per cent of alcohol was found on assay. Further examination of this article reveals a still more dangerous ingredient in its composition. The sample analyzed was found to contain one-fourth grain of morphia to the ounce of the so-called "Essence of Oats." A more insidious and dangerous fraud can scarcely be imagined, especially when administered, as this is recommended, for the cure of inebriety or the opium habit.

The "Best" Tonic, Milwaukee, Wisconsin. "A concentrated liquid extract of malt and hops. Neither alcohol nor spirits used in its preparation. Dose, from a wineglassful to a pint bottle full per day." Percentage of alcohol found, 7.65.

Carter's Physical Extract, Georgetown, Mass. Dose, 1 tablespoonful, 3 times daily. 22 per cent of alcohol found on assay.

Hooker's Wigwam Tonic, Haverhill, Mass. One tablespoonful, 3 times daily. 20.7 per cent of alcohol found on assay.

Hoofland's German Tonic, Philadelphia. Admits Santa Cruz rum. Wineglassful, 4 times daily. 29.3 per cent.

Hop Tonic, Grand Rapids, Mich. One tablespoonful to wineglassful, 3 times a day. 7 per cent.

Howe's Arabian Tonic, New York. "Not a rum drink." Tablespoonful to wineglass, 4 times daily. 13.2 per cent.

Jackson's Golden Seal Tonic, Boston. Admits Marsala wine. Half wineglass, 3 times daily. 19.6 per cent.

Liebig Co.'s Coca Beef Tonic, New York. "With sherry." Two to four teaspoonfuls, 3 times daily. 23.2 per cent.

Mensman's Peptonized Beef Tonic, New York. "Contains spirit." One tablespoonful to 3, 3 times daily. 16.5 per cent.

Barker's Tonic, New York. "A purely vegetable extract." "Stimulus to the body without intoxicating." "Inebriates struggling to reform will find its tonic and sustaining influence on the nervous system a great help to their efforts." Dose as tonic, 1 to 2 teaspoonfuls, 1 to 3 times daily. 41.6 per cent.

Schenck's Sea-weed Tonic, Philadelphia. "Distilled from sea-weed after the same manner as Jamaica spirits is from sugar cane. It is therefore entirely harmless, and free from the injurious properties of corn and rye whiskey." Dose, half wineglass, 3 times daily. 19.5 per cent.

Bitters.

Atwood's Quinine Tonic Bitters, Boston. Dose, half tablespoonful to half wineglass, mixed with water, wine or spirit, 3 times daily. 29.2 per cent.

L. F. Atwood's Jaundice Bitters, Portland, Me. Half tablespoon to wineglass, 1 to 6 times daily 22.3 per cent.

Moses Atwood's Jaundice Bitters, New York. Half tablespoon to wineglass, 1 to 6 times daily. 17.1 per cent.

H. Baxter's Mandrake Bitters, Burlington, Vt. One to 2 tablespoonfuls. 16.5 per cent.

Boker's Stomach Bitters, New York. Dose not given. 42.6 per cent.

Brown's Iron Bitters, Baltimore, Md. "Perfectly harmless." "Not a substitute for whiskey." Tablespoonful. 19.7 per cent.

Burdock Blood Bitters, Buffalo, N. Y. Teaspoonful to tablespoonful, 3 times daily. 25.2 per cent.

Carter's Scotch Bitters, Georgetown, Mass. Tablespoonful to wineglassful, as occasion requires. 17.6 per cent.

Colton's Bitters, Westfield, Mass. Teaspoon to 2 tablespoonfuls, 3 times daily. 27.1 per cent.

Copp's White Mountain Bitters, Manchester, N. H. "Not an alcoholic beverage." Wineglassful. 6 per cent.

Drake's Plantation Bitters, New York. "Contains St. Croix rum." Wineglassful, 3 times daily. 33.2 per cent.

Flint's Quaker's Bitters, Boston. Teaspoonful, 6 times daily. 21.4 per cent.

Goodhue's Bitters, Salem, Mass. Half wineglassful. 16.1 per cent.

Hartshorn's Bitters, Boston. Tablespoon to half wineglassful. 22.2 per cent.

Hoofland's German Bitters, Philadelphia. "Entirely vegetable and free from alcoholic stimulant. Tablespoonful, 4 times daily. 25.6 per cent.

Hop Bitters, Rochester, N. Y. One to 3 tablespoonfuls, 3 times daily. 12 per cent.

Hostetter's Stomach Bitters, Pittsburg, Pa. Wineglassful, 3 times daily. 44.3 per cent.

Kaufman's Sulphur Bitters, Boston. "Contains no alcohol." Tea to tablespoonful. It contains no sulphur, but has 20.5 per cent of alcohol.

Kingsley's Iron Tonic, Northampton, Mass. One to 2 teaspoonfuls, 3 times daily. 14.9 per cent.

Langley's Bitters, Boston. Half wineglass or more, 3 times daily. 18.1 per cent.

Liverpool's Mexican Tonic Bitters, Boston. Half to full wineglassful, 3 times daily. 22.4 per cent.

Oxygenated Bitters, New York. Tea to tablespoonful. Acid but no alcohol.

Pierce's Indian Restoration Bitters, Boston. Up to wineglassful, and to 6 times daily. 6.1 per cent.

Z. Porter's Stomach Bitters, New York. Tablespoonful or more several times daily. 27.9 per cent.

Rush's Bitters, New York. Wineglassful, 4 times daily. 35 per cent.

Dr. Richardson's Concentrated Sherry Wine Bitters, Wakefield, Mass. Tablespoonful to half wineglass or more, 3 times daily, "or when there is sensation of weakness or uneasiness at the stomach." 47.5 per cent.

Secor's Cinchona Bitters, Providence, R. I. Half wineglassful, 3 times daily. 13.1 per cent.

Shonyo's German Bitters, Concord, N. H. Tablespoon to wineglassful. 21.5 per cent.

Job Sweet's Strengthening Bitters, New Bedford. Tablespoonful to wineglassful, 3 times daily. 29 per cent.

Thurston's Old Continental Bitters, Lynn, Mass. Tea to 2 tablespoonfuls. 11.4 per cent.

Walker's Vinegar Bitters, New York. "Free from all alcoholic stimulants. Contains no spirit." Half to full wineglass. 6.1 per cent.

Warner's Safe Tonic Bitters, Rochester, N. Y. Tablespoon to wineglassful, 35.7 per cent.

Warren's Bilious Bitters, Boston. Teaspoon to 2 tablespoonfuls, 1 to 3 times daily. 21.5 per cent.

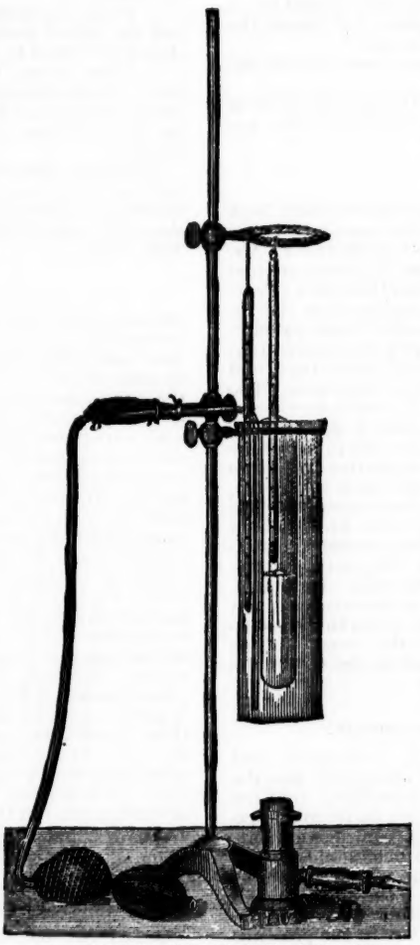
Wheeler's Tonic Sherry Wine Bitters, Boston. Two-thirds wineglass, 2 times daily. 18.8 per cent.

Wheat Bitters, New York, Dessert to wineglass, 3 times daily. 13.6 per cent.

Faith Whitcomb's Nerve Bitters, Boston. Tablespoonful, 3 times daily. 20.3 per cent.

Dr. William's Vegetable Jaundice Bitters, Lowell, Mass. Half to full wineglass, 1 time daily. 18.5 per cent.

DETERMINATION OF THE MELTING POINT OF FATS.



Apparatus for determining the Melting Point of Fats.

In the official methods of analysis of the Association of Official Agricultural Chemists for 1887-88 (U. S. Dept. of Agriculture), the following method of determining the melting point of butter-fat is recommended. This is, of course, equally applicable to other fats:

Apparatus.—The apparatus, Fig. 1, consists of (1) an accurate thermometer for reading easily tenths of a degree; (2) a less accurate thermometer for measuring the temperature of water in the large beaker glass; (3) a tall beaker glass, 35 Cm. high and 10 Cm. in diameter; (4) a test-tube 30 Cm. high and 3.5 Cm. in diameter; (5) a stand for supporting the apparatus; (6) some method of stirring the water in the beaker; for example, a blowing bulb of rubber and a bent glass tube extending to near the bottom of the beaker; (7) a mixture of alcohol and water of the same specific gravity as the fat to be examined.

Manipulation.—The disks of the fat are prepared as follows: The melted and filtered fat is allowed to fall from a dropping tube from a height of 15 to 20 Cm. on to a smooth piece of ice floating in water. The disks thus formed are from 1 to 1½ Cm. in diameter, and weigh about 200 milligrams. By pressing the ice under the water, the disks are made to float on the surface, whence they are easily removed with a steel spatula.

The mixture of alcohol and water is prepared by boiling distilled water and 95% alcohol for ten minutes, to remove the gases which they may hold in solution. While still hot, the water is poured into the test-tube already described until it is nearly half full. The test-tube is then filled with hot alcohol. It should be poured in gently down the side of the inclined tube to avoid too much mixing. If the tube is not filled until the water has cooled, the mixture will contain so many air bubbles as to be unfit for use. These bubbles will gather on the disk of fat as the temperature rises, and finally force it to the top of the mixture.

The test-tube containing the alcohol and water is placed in a vessel containing cold water, and the whole cooled to below 10° C. The disk of fat is dropped into the tube from the spatula, and at once sinks until it reaches a part of the tube where the density of the alcohol water is exactly equivalent to its own. Here it remains at rest, and free from the action of any force save that inherent in its own molecules.

The delicate thermometer is placed in the test-tube, and lowered until the bulb is just above the disk. In order to secure an even temperature in all parts of the alcohol mixture in the vicinity of the disk, the thermometer is moved from time to time in a circularly pendulous manner. A tube prepared in this way will be suitable for use for several days, in fact until the air bubbles begin to attach themselves to the disk of fat. In no case did the two liquids become so thoroughly mixed as to lose the property of holding the disk at a fixed point, even when they were kept for several weeks.

In practice, owing to the absorption of air, it has been found necessary to prepare new solutions every third or fourth day.

The disk having been placed in position, the water in the beaker glass is slowly heated, and kept constantly stirred by means of the blowing apparatus already described.

When the temperature of the alcohol water mixture rises to about 6° below the melting point, the disk of fat

begins to shrivel, and gradually rolls up into an irregular mass.

The thermometer is now lowered until the fat particle is even with the centre of the bulb. The bulb of the thermometer should be small, so as to indicate only the temperature of the mixture near the fat. A gentle rotary movement should be given to the thermometer bulb, which might be done with a kind of clockwork. The rise of temperature should be so regulated that the last 2° of increment require about ten minutes. The mass of fat gradually approaches the form of a sphere, and when it is sensibly so, the reading of the thermometer is to be made. As soon as the temperature is taken, the test-tube is removed from the bath, and placed again in the cooler. A second tube, containing alcohol and water, is at once placed in the bath. The test-tube (ice-water being used as a cooler) is of low enough temperature to cool the bath sufficiently. After the first determination, which should be only a trial, the temperature of the bath should be so regulated as to reach a maximum about 1.5° above the melting point of the fat under examination.

Working thus with two tubes, about three determinations can be made in an hour.

After the test-tube has been cooled, the globule of fat is removed with a small spoon attached to a wire, before another disk of fat is put in.

Phenacetin.

INDEPENDENT experimental evidence has recently been published with respect to the value of the new antipyretic *phenacetin*, which on the whole has been in its favor. Mr. Grenfell describes in detail several cases of pyrexia treated with it in the Wandsworth and Clapham Infirmary (*Practitioner*, May, p. 344), and sums up by saying that the results show that phenacetin is an undoubted anti-pyretic. The effect is perceptible half an hour after administration; the patient generally perspires freely and feels drowsy, and after sleep is freer from pain and more comfortable. The most satisfactory dose for an adult was found to be about 8 grains. Mr. Roe (*Brit. Med. Jour.*, May 26th, p. 1,113) states that he has found phenacetin to act admirably in from four to twelve grain doses, and that it has a greater and more prolonged effect upon the temperature than antipyrin, whilst it produces no rigors, vomiting, or nausea. He has heard that it has been used with effect in the treatment of neuralgia. Dr. Koller, of Vienna, also has published his experience with the drug (*Brit. Med. Jour.*, May 26th, p. 1,126) which is fairly in accord with the foregoing. He states, however, that although the fall in temperature is not usually accompanied with perspiration, when this does occur great care is required in exhibiting the drug. In one case of this kind some alarm was caused by the fall of the temperature to 95° F.—*Pharm. Journ.*

Note on Antifebrin and Phenacetin.

THE close resemblance of antifebrin (acetanilide) and phenacetin in some of their physical properties and the difference in their cost suggest the possibility that the higher-priced phenacetin may sometimes undergo admixture with antifebrin, and for such a contingency Mr. Schwaz suggests the following means of detection (*Pharm. Zeit.*, June 20th, p. 364): If 1 gramme of phenacetin be heated with 2 C.c. of soda solution, upon the addition of a few drops of chloroform and again heating, the odor given off is aromatic and not disagreeable, but in the presence of a trace of acetanilide the isonitril reaction occurs, and the extremely repulsive but characteristic smell of phenylcarbylamine becomes perceptible. Again, when acetanilide is boiled with caustic soda solution, a separation of oily drops of aniline floating on the surface of the liquid takes place, but no such separation takes place when phenacetin is similarly treated. Lastly, if the liquid resulting from heating acetanilide with caustic soda be shaken with ether, the ether evaporated, a little water added to the residue and then a drop of liquefied carbolic acid and some filtered 10-per-cent solution of chloride of lime, it is colored blue-green; a drop of hydrochloric acid changes this color to an onion-red, but saturation with ammonia restores the original blue-green color (indophenol reaction). Phenacetin similarly treated gives with the chloride of lime solution a cherry red, which is not affected by hydrochloric acid or by ammonia. In commenting subsequently upon this communication (*Pharm. Zeit.*, June 27th, p. 383), Mr. Ritsert recommends the substitution in the first test of a fragment or two of chloral hydrate for the chloroform, as the reaction is more delicate in the presence of *nascent* chloroform. He also points out the necessity for caution in the employment of this test, on account of the noxious properties of the vapor of phenylcarbylamine.

The occurrence of antifebrin containing unaltered aniline has been reported, so that the following test recommended by Mr. Salzer may prove useful for identifying antifebrin as well as the contamination (*Pharm. Zeit.*, June 20th, p. 364). If pure acetanilide be dissolved in cold hydrochloric acid and covered with solution of chloride of lime, a white precipitate is formed which is redissolved upon shaking the acid, but after a time there is again a separation of beautiful silky, colorless needles. In the presence of aniline, the known color reaction takes place, indicating the formation of magenta.—*Pharm. Journal*, June 30th.

Effects of Bitter Tonics.

DR. REICHMANN, of Warsaw, gives the following results of several experiments on the effects of bitter tonics upon the stomach:

1. There was a great difference in the effect of the different bitter medicines on the stomach.

2. In every stomach which was empty or not digesting, where the gastric juice was normally secreted, or where its secretion was either affected or increased, there was a much less activity of secretion immediately after taking the bitters than after taking distilled water.

3. If the bitter infusion was taken on an empty stomach, the secretory apparatus was excited to an increased activity after the disappearance of this substance from the stomach.

4. When the stomach was digesting (*e. g.*, white of egg) and the bitters were taken, the mechanical activity of the stomach seemed to be injured by the use of the bitters.

5. After taking the bitter infusion for several weeks there was no change in the function of the healthy or diseased stomach, and after the use of the bitters was given up, the function of the stomach did not seem to be changed.

Therefore: The bitter medicines should be prescribed only in those cases in which the secretory activity of the stomach is affected; in those cases the bitter medicines should be taken about *a half an hour before eating.—Md. Med. Jour.*

New Use for Codeine.

A NEW use for codeine is proposed by Dr. Lauder Brunton (*Brit. Med. Journ.*), viz., for the relief of pain in abdominal disease. This is probably, as he points out, a new application of an observation by Barbier in 1834, when he came to the conclusion that codeine acts chiefly upon the sympathetic nervous system, and especially upon that part of it which is in the region of the stomach. Dr. Brunton's experience with codeine satisfies him that it has a powerful action in allaying abdominal pain, and it can be pushed to a much greater extent than morphine without causing drowsiness, or interfering with the respiration or with the action of the bowels. It is specially indicated in cases where the heart or lungs are affected, also where it is desired to relieve the pain without interfering with the action of the bowels. On the other hand, in cases where there has been much diarrhœa, as in some cases of malignant disease of the colon or rectum, the absence of any tendency to lessen peristaltic movement is rather a disadvantage to codeine as compared with morphine or opium. In cases of long-continued enteralgia without organic disease, it has continued to relieve pain for months together, without the dose being increased beyond 1 grain three times a day, and Dr. Brunton found the same to be the case where the presence of a tumor, in addition to other symptoms, had led to the diagnosis of malignant disease. It is evident, therefore, that codeine is well worthy of further trial in these particular directions.—*Chem. and Drugg.*

Chlorine Water.

(Paper read at the meeting of the Ohio State Pharm. Assoc., by J. Geo. Spenzer, of Cleveland, O.)

QUERY No. 33.—*At what rate does decomposition proceed—Data are wanted as to its keeping qualities under varying conditions.*

The keeping qualities of chlorine water depend principally on the manner of its making and the method of keeping it.

I have seen chlorine water kept in amber cork-stoppered bottles be useless in two or three months, when kept in cool dark places; while if kept in amber glass-stoppered bottles and opened from to time it will be quite strong in six months. If prepared according the U. S. Pharmacopœia it will keep for a year.

I have a few suggestions to offer which may have some merit, *i. e.:* If the distilled water be first boiled to expel air and then cooled out of contact with the same, thoroughly saturating the cold water with chlorine, filling small amber glass-stoppered bottles with the chlorine water, driving out any air with a stream of chlorine and stopping the bottles with stoppers greased with tallow, the water will keep for from one and a half to two years.

Chlorine gas itself can be kept in this manner for two years.

Chlorine water gradually decomposes as air is introduced in dispensing; but if kept in small, well-stoppered bottles as directed in the Pharmacopœia, it can always be had fresh.

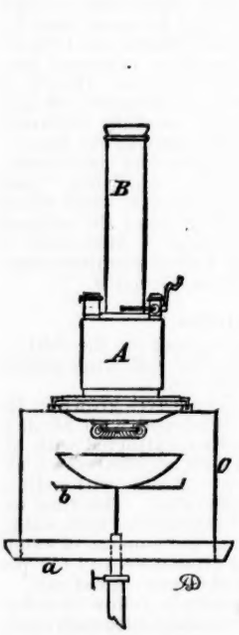
Another suggestion which is very serviceable is Winkler's method of furnishing chlorine from chlorinated lime. The chlorinated lime is mixed with plaster of Paris made into a paste with water and formed into balls and dried. These are then used with dilute acid in any of the forms of common generating appparatus. Used in this manner it should displace to a certain extent the old method of heating black oxide of manganese and hydrochloric acid together.

SIEMENS' INVERTED BURNER FOR RAPID EVAPORATION.

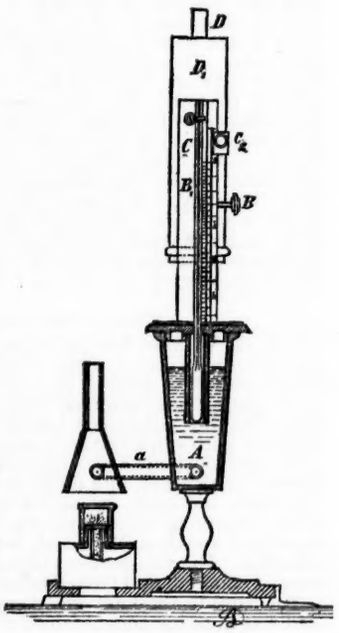
WALTER HEMPEL proposes to utilize Siemens' "regenerative burner," on a smaller scale, for the purpose of rapidly evaporating liquids.

In the accompanying cut, *A* is the "regenerative burner," with flame directed downwards [as supplied by the "Fabrik patentierter Beleuchtungs-apparate," Dresden (Altstadt), Fabrikgasse 5]. *C* is a glass cylinder resting upon a plate *a*, which can be adjusted higher or lower, and the outer rim formed by the cylinder and edge of the plate is filled with fine sand. The capsule containing the liquid to be evaporated is placed upon a support *b*, which may be raised or lowered independent of the plate. The burner being a stationary fixture, screwed fast to some gas delivery pipe, it is necessary to have the other parts of the apparatus movable. When a capsule is to be introduced or removed, the plate with cylinder is lowered by a mechanism not shown in the cut, and when the flame is required to do its work, it is again raised.

The rate of evaporation is regulated either by the size of the flame or by raising or lowering *b*. Evaporation takes place very rapidly, much more so in proportion than when applying heat from below in the usual manner. As the capsule does not come in contact with the flame, it does not matter what material it consists of. The author reports that he has concentrated solution of fluoride of ammonium in capsules made of wood and paper pulp. The absorption of sulphuric acid from the flame is the smaller the closer the flame is to the liquid to be evaporated, and



Siemens' Inverted Burner.



Kapeller's Ebullioscope.

none at all is absorbed if the flame is in contact with the liquid.—*Ber. d. D. Chem. Ges.*, 1887, 900.

Since this article has been in type, we have received from the manufacturers a circular in which the apparatus is described with greater detail. Some changes have been made in the form of support, and the admission of gas, but the main parts and the principle remain the same.

These burners are made, for the present, in two sizes, No. 1, consuming about 9 cubic feet per hour, and evaporating about ½ pint of water from a capsule 5 inch. in diameter, costs 80 marks; No. 2, consuming about 14 cubic feet of gas per hour, and evaporating about 14 fluidounces of water from a capsule of 10 inch. in diameter, costs 100 marks, at the factory.

ALCOHOLOMETRY BY MEANS OF THE EBULLIOSCOPE.

H. KAPELLER, of Vienna, has constructed an ebullioscope for determining the percentage of absolute alcohol by volume in any liquid. As the assay of alcohol in complex liquids is usually only possible by distilling off the alcohol, which often requires considerable time, and Kapeller's new method requires only some 15 or 20 minutes, this apparatus will often be found very useful.

The instrument (see cut) consists of a boiler with exterior chamber, and a tightly fitting lid bearing a condenser and a thermometer with an adjustable scale of graduation calculated for directly indicating the percentage of alcohol. Before performing any assay, the zero-point of this scale must each time be exactly adjusted in the following manner. The boiler *A* being filled, to the upper ring, with water, heat is applied which will cause the water to boil in about 5 minutes, whereupon the mercury in the thermometer will rise to the boiling point of water, which is, of course, liable to vary according to atmospheric pressure. But turning the screw *B*, the graduated scale is now so adjusted that its zero-point exactly coincides with the level of the mercury, and the scale is fixed in this position by a set-screw. The boiler is now emptied, cooled, rinsed with the alcoholic liquid to be tested, and then filled with this to the upper ring. Heat is now applied, as before. The condenser is supplied with very cold water, so as to prevent the escape of vapors of absolute alcohol, and to maintain a uniform boiling point. As soon as the column of mercury remains at a constant level, the degrees on the scale are read off, and these are so adjusted that they will at once express the percentage by volume, of absolute alcohol, in the liquid.

In the case of highly alcoholic liquids, where the graduation would not reach far enough to indicate the percentage, the boiler is filled with the liquid only to the first ring, and distilled water then added up to the second ring. The result found is then simply doubled to give the real percentage.

APPARATUS FOR DETERMINING SUGAR IN URINE.

FOR the determination of sugar in urine, Fleischer recommends to use flasks (see cut) having a lateral, open, graduated tube arising from near the bottom, and divided into two unequal compartments by a glass diaphragm through the centre of which arises a hollow glass tube. Into the lower compartment (Hg) mercury is poured, which will, of course, rise to the same level, both in the flask itself and in the lateral tube. Into the upper compartment, 10 C.c. of the urine ("Harn"), together with a sufficient quantity of yeast ("Hefe"), are introduced, and the rubber stopper then inserted. Into a second flask a like quantity of mercury is poured, and into its upper compartment 10 C.c. of water, some yeast, and 0.1 Gm. of pure grape-sugar, which may be kept on hand for this purpose, put up in gelatin capsules. Both flasks are then set aside at a moderately warm temperature until the fermentation in both is completed. Having previously noted the exact height of the mercurial columns in the lateral tubes, and knowing by observation how far the mercury has been pushed upward by the compressed air and gas in the flask charged with 0.1 Gm. of grape-sugar, a simple comparison with the other flask and tube will show how much more or less pressure of gas is in the other, and, consequently, how much more or less grape-sugar the urine contained. *Med. Chir. Rundschau; Chem. Centralbl.*

Antiseptics in Phthisis.

THE antiseptic treatment of phthisis appears to be generally recognized now as the rational method of treatment. The medicaments used are numerous, and the ways and means taken by prescribers to get the antiseptic or bactericides, as most of them are, to act upon the consumption bacillus, are perplexing. The great faults of therapeutic writers who are devoted to the subject are that they sound the praises of their peculiar methods of treatment before they have sufficiently demonstrated the value thereof on a large number of cases. One, two, or a dozen cures are not enough to prove the infallibility of any method. Phthisis is one of the scourges of this country, and there ought to be no difficulty in getting a hundred, or even a thousand, patients to submit to any course of treatment which fairly promises to be successful. Until that is the case, we must be content with such results as are made public. In the *Provincial Medical Journal*, Mr. F. Taylor Simpson describes a case in which he tried a method of treatment which had occurred to him. The patient was a young man of 22, who presented all the symptoms of early phthisis, "crowds of tubercle bacilli" being found in his sputum. He was ordered to sleep in a large, well-warmed room, the air of which was to be rendered aseptic by steam impregnated with oleum eucalypti and oleum pini sylvestris; to take ol. morrhuæ, ℥ ij., and syr. hypophosph. co., ℥ i., three times a day; to eat as much as possible; and to use the following inhalation every night:

Hydrargyri Chloridi Corros.	gr. ½
Ammonii Chloridi	gr. ½
Aquæ dest.	℥ iv.

One tablespoonful to be added to a tablespoonful of hot distilled water, and thoroughly inhaled, in the form of spray, every night.

The patient began to show improvement in about three weeks, and the spray was gradually increased in strength to ¼ grain of the sublimate per ounce. Improvement continued, the crepitations disappearing in two months, and the tubercle bacilli about the same time. At the end of three months, the inhalations were stopped, and the patient put on carefully regulated and nourishing diet, but by this time he had increased in weight by a stone and was quite well.—*Chem. and Drugg.*

To clean Vessels of Sulphide of Lead.

FISCHER gives the process described below, in the *Pharm. Zeit.* It is often extremely difficult to remove a dried residue of lead sulphide from glass or porcelain apparatus, the endeavor frequently ending in fracture of the vessel. Fischer recommends the addition of a small quantity of liquor sodæ and some hydrogen peroxide solution. The process will clean the oldest concretions off in a short time by the oxidation of sulphide to sulphate by the H_2O_2, and the solution of the sulphate of lead by the caustic soda.

Improvement in the Manufacture of Phosphorus.

A PATENT was recently granted to A. Nicolle, of Paris, for an improved process of making phosphorus.

The mineral phosphate, either natural or artificial, is treated with nitric acid, and then, on the addition of potassium sulphate, the calcium is precipitated as sulphate. This is removed by filtration, and mercurous nitrate in proper quantity is introduced. The phosphate of mercury thus obtained is distilled with carbon, when first mercury and then phosphorus are distilled over. To the calcium nitrate solution more potassium sulphate is added, and the resulting potassium nitrate crystallized.

Emulsion of Cod-Liver Oil with Hypophosphite of Calcium.

MR. W. B. ALLISON, of Hartshill, Stoke-upon-Trent, writes to the *British and Colonial Druggist:* I inclose a formula for a cod-liver oil emulsion which may be useful to some of your readers, as it is one of the best I have ever used for making a good keeping emulsion, and for the idea for which I have to thank your valuable *Diary*. The formula should prove especially valuable in hospital practice. I would recommend the aid of a Taylor's No. 4 Patent Churn, driven by steam power at about 70 revolutions per minute.

The following is the formula referred to by our correspondent:

Take of

Fine Norwegian non-freezing cod-liver oil	4 galls.
Powd. Tragacanth	6 oz. 5 drms. 20 gr.
Tinct. of Benzoin or Tolu (2 oz. to Oi)	8 fl. oz.
Spirit of Chloroform	8 fl. oz.
Glycerin	32 fl. oz.
Saccharin	240 grs.
Oil of Lemon or Cassia	2 fl. oz.
Hypophosphite of Calcium	26 oz. 5 drms. 20 gr.

Place the Oil in the churn and pour in the Tragacanth powder, Tr. Benzoin, and Sp. Chloroform previously mixed together; agitate briskly until a smooth mixture is formed, then add all at once 2 gallons of Water in which the Hypophosphite of Calcium has been dissolved, and again agitate. Lastly, add the Essential Oil, Glycerin (in which the Saccharin has been dissolved by a very gentle heat), and sufficient Water to make the product measure 8 gallons. This should be churned until a thick, creamy, and perfect emulsion is formed.

Utilization of Liquid Carbonic Acid as a Preservative.

PROF. REITLECHNER, of the celebrated vinicultural institution Klosterneuburg, reports that the employment of liquid carbonic acid in wine cellars promises to be of the greatest importance. It has been found that red wines saturated with, or otherwise protected by carbonic acid gas, retain their coloring matter much better, and that white wines preserve their peculiar bouquet. The bleaching of red wines is due to the action of the oxygen of the air. In some peculiar wines, the coloring matter does not bleach, but becomes darker. Oxygen also alters or destroys the bouquet. If, however, the wine is saturated with carbonic acid gas, these deteriorations will not occur, nor will there be any ropy deposit or active fermentation produced.

In connection with the above we would say that the manufacture of liquid carbonic acid promises to be a very profitable undertaking in this country. But it must be remembered, that for its transportation very strong metallic vessels (small steel-fountains will be best) are required, which necessitate a considerable outlay at first and which the manufacturer must make arrangements to receive back empty for refilling. Moreover, the contents of a fountain are of so comparatively moderate cost that it would not pay to transport the fountains filled and to reship them beyond a certain distance from the factory. In fact, a number of independent factories would have ample room if scattered over different sections of the country, where the gas can be utilized to advantage in large quantities. Of course, liquid carbonic acid is much more economical for those who use much of it, than gas under pressure such as is used in soda-fountains. And it can even be used in the latter to advantage. For lager-beer, ale and similar liquids which are drawn from casks, it will furnish not only the requisite pressure, to force them out of the faucet, but it will prevent them from spoiling. Fruit-juices, and many other substances, which are liable to change, can be preserved by saturating them with the gas, tightly corking and securely sealing the stopper.

The Production of Indigo in Manchuria.

THE following account of the production of indigo, given by a correspondent of the *Chinese Times*, may be of interest: On leaving Hai-lung-ch'eng we turned due North along the eastern border of the imperial forest, through a wide valley stretching from the city to Tung-ho, a distance of over 100 miles. This valley is fully cultivated, and well cultivated up to the border of and even encroaching on the forbidden forest. One of the most important products of this as of the other valleys is indigo. Our attention was the more directed to it here on account of the unusually large number of indigo tanks we met with in this valley. Every farmer large or small has got an indigo vat or vats attached to his farm as surely as he has got a threshing-floor. The plant, probably, *Polygonum Chinese*, grows to a height of from two to three feet, and flowers in the month of August. As soon as the flowers appear the plant is cut down, and the work of manufacturing it at once proceeded with. Sometimes the method of manufacture is simple in the extreme, the only thing visible being a round pit dug in the ground. Generally, however, there are four such pits; one is simply a water pond, and is called the *shui y' ao;* two of equal size, parallel to each other, are called *tien ch'ih*; another curved tank is called the *k'ung chih*. In addition there is usually a large wooden trough, called the *shui kuei*, placed between the parallel vats. The latter are filled with the stems and flowers of the plant, and covered with water, which is conveyed from the pond by an aqueduct. The indigo remains infusing in the tanks for twelve hours, by which time all the dye is supposed to be extracted, the liquid is then transferred from the vats into the wooden trough, when lime is added and the contents are violently agitated for some time by being beaten with a shovel shaped instrument called the indigo rake. This completed, the decoction is poured into the curved tank, which is faced with mortar. Here it is allowed to settle; the clear water is then drawn off, and the sediment, of a pulpy consistency, carefully removed. In this condition it is put into boxes, sold to the dealers for 150 cash a catty, shipped to Shanghai and other Southern ports, where the manufacture is completed, "and then," they say, "it comes back to us again in small round pieces, which are sold for about four times the original price under the name of Western indigo." Hundreds of thousands of catties are turned out of those primitive manufactories every year.—*Br. and Colon. Druggist.*

Coca grown in India.

C. J. H. WARDEN has published a paper on the cultivation of coca in India, from which the following salient points are taken (after *J. Soc. Chem. Ind.*):

The author has examined some coca leaves grown in India. The dry pulverized leaves moistened with alcohol, acidified with sulphuric acid were then extracted with alcohol, the alcoholic extract mixed with acidified water, exhausted with ether, and finally made alkaline with sodium carbonate and again exhausted with ether. This final extract containing the cocaine, was washed twice with water, dried and weighed, the result being the amount of crude alkaloid. The dry leaves yielded from 0.358 to 1.671 per cent of alkaloid, and from 6.36 to 12.64 per cent of ash.

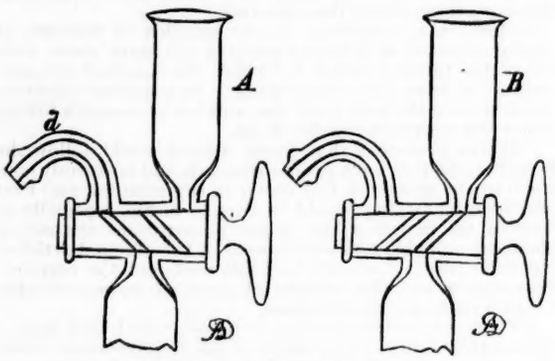
The "crude alkaloid" was very faintly yellow in color, and was in no instance obtained crystalline, although many experiments were made to get a crystalline alkaloid, both by changing the mode of preparing the leaves and by modifying the mode of extraction by the use of different acids and solvents, and varying temperatures. Even Williams' method of purification (*Pharm. J. Trans.*, 1887) failed to yield crystals. The only instance of crystallization was the deposition of star-shaped crystals on one occasion from the ethereal solution of the alkaloid obtained from the decomposition of the soluble platino-salt. This extract of Indian coca leaves yields a soluble and insoluble platino-salt, both yielding bases producing a marked anæsthetic effect on the tongue. Howard shows that in the leaves he examined, only the soluble platino-salt yielded a base producing anæsthesia, the insoluble salt giving some other base. The author found from 18.71 to 19.3 per cent of platinum in his soluble platino salt, and 18.88 per cent in his insoluble platino salt; he attributes discrepancies from the theoretical to varying amounts of cocamine in the Indian leaves.

The author observed the largest amount of coca-tannin acid was associated with the largest amount of alkaloid, and suggests that possibly the alkaloid exists in the leaves as coca-tannate. With regard to hygrine, no volatile base has been found in the Indian leaves.

Judging from the available data, which, however, are obtained from leaves and plants of various ages, the percentage of alkaloid in Indian leaves is not much affected by either altitude or rainfall. The plants may require both nitrogenous and potash manures. The best mode of preparing the leaves is to dry them as rapidly and thoroughly as possible at the lowest possible temperature, and directly they are cold to pack them in air-tight boxes to avoid absorption of moisture, as the dry leaves are very hygroscopic. The leaves grown in India contain more alkaloid than the South American leaves, and the non-crystalline character of the alkaloid does not appear to detract from its physiological activity.

AN IMPROVED FORM OF LUNGE'S NITROMETER.

LUNGE'S, as well as Allen's, nitrometer has become so well known as the most convenient apparatus for measuring the volume of gas generated by certain reactions (as, for instance, in estimating spirit of nitrous ether, urea, etc.) that we need not give a minute description. Lunge has recently introduced a further improvement, which consists in the employment of the obliquely bored stop-cocks, likewise previously described by us. This form of stop-cock not only permits the alternate connection of different parts of the same apparatus, but it also prevents the gradual formation of leaky passages in the stop-cock itself.



Improved Stop-cocks for Lunge's Nitrometer.

As formerly constructed, the nitrometer had the shape as shown in Fig. 1. In this case, we may suppose that the apparatus is to be used for the estimation of urea, the urine being contained in the little tube *f*, while the bottle *e* contains a certain quantity of solution of hypobromite of sodium. On mixing the two solutions, nitrogen is set free, which displaces a corresponding volume of water from the graduated tube, and by reading off the volume subsequently, after having put the two tubes at such a level that the liquid in both is at the same height, the amount of urea may be known from the volume displaced, each cubic centimeter being equal (theoretically) to 0.0027 Gm. of urea.

As will be seen, the stop-cock is itself perforated. But since it is necessary to shake the little flask *e* while connected with the apparatus, it happens sometimes that the stop-cock becomes loosened, whereby air is admitted and the whole analysis vitiated. In the new form of apparatus, the stop-cock has two oblique perforations, and the little generating flask is connected with the independent neck *d*. By giving the stop-cock a half revolution, the two positions shown at *A* and *B* are produced, and there is no further risk of a leak.—After *Ber. d.D. Chem. Ges.*, 1888, 376.

The alleged Incompatibility of Potassium Chlorate with the Iodide.

THE generally accepted opinion is, that chlorate of potassium should not be administered at the same time as iodide of potassium, for the reason that on boiling the salts together a poisonous compound—potassium iodate—will be formed. MM. Chuche and Desgroz have now come forward to disprove this opinion, and relate the following experiments to support their views: First a mixture of iodide and chlorate dissolved in water was kept in a test tube for two hours at a temperature of from 35° to 37° C. (95° to 99° F.) by means of a water-bath. The test for iodate, namely, acetic acid and chloroform, proved that none had been formed. The second series of experiments consisted in the addition of very weak lactic acid to the same chlorate and iodide solution, to be heated in the water-bath. The idea was to more exactly represent the normal condition of the digestive process. On testing, as before, a light pink color developing in the chloroform showed the presence of minute traces of free iodine. Finally, to ascertain whether the liberated iodine was owing to the formation of an iodate or to the usual effects of acids, the experiment was repeated with iodide of potassium and lactic acid, without chlorate, all the conditions remaining otherwise exactly the same. The result was, on testing, a pink coloration of the chloroform of precisely the same tint and depth as in the preceding experiments. Hence MM. Chuche and Desgroz have come to the conclusion that, since no iodate was formed under conditions resembling those of digestion, the chlorate and iodide of potassium are not incompatible. Such a deduction, it is scarcely necessary to say, is rather premature. The experiments quoted only show that in a glass tube, at a temperature below 100° F., will not, as it does at 212° F., turn iodide into iodate of potassium, but they prove nothing as regards the chemical changes in the system, still less do they counterbalance the poisoning cases on record caused by the simultaneous administration of the two salts.—*Chem. and Drugg.*

NEW GAS-GENERATORS.

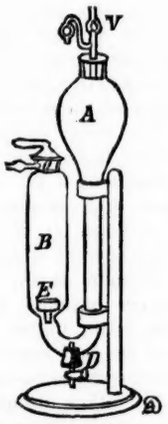
GREINER and FRIEDRICHS have constructed a new gas-generator. The vessel *A* serves to receive the acid, and the cylinder *B* the substance which is to yield the gas (sulphide of iron, marble, zinc, etc., etc.). *E* is a perforated diaphragm of porcelain, *O* a hollow glass stopper provided with a lateral tube which is to be connected with the gas delivery tube. *D* serves for withdrawing the exhausted acid, and *V* is a safety-valve. Further description of the apparatus is unnecessary.—*Chem. Zeit.*

G. NEUMANN describes an improved gas generator, which is shown in the accompanying illustration.

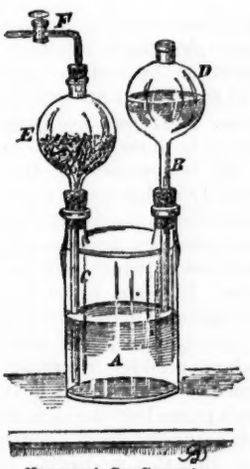
It consists of a double-necked Woulff's bottle *A*, bearing two globe funnels with long tubes, in its tubulures. One of these (*D*) is adjusted at a higher level than the other. The tube of *E* reaches nearly to the bottom of the bottle, while the other reaches only about half-way down. The lower situated globe funnel is provided with a glass stop-cock fitted into its neck, and the other remains open. For use, the globe *E* is filled with the solid substance, which is to give up gas upon the access of an acid. Next, open the stop-cock *F*, and pour enough of the exciting liquid (acid, etc.) into the globe *D* until the flask is filled to the end of the tube *B*. Now close the stop-cock *F*, and pour enough liquid in until *D* is about two-thirds full. When the apparatus is required for use, open the stop-cock, and the column of liquid in *D* will soon attain its level with that in *E*. To prevent solid particles from clogging the tube of the globe funnel *E*, a rubber plate (or other contrivance) is put underneath the solid substance from which the gas is generated.

The application of this apparatus to the preparation of hydrochloric acid gas, ammonia, and nitrogen may be accomplished in the following manner:

1. *Hydrochloric acid gas.*—This is best prepared from carnallite ($K_2Mg_2Cl_6.12H_2O$) and concentrated sulphuric acid. The latter acts upon the mineral slowly, hence the current of gas will be feeble; but it is very regular, and, with one pound of carnallite, may last during two or three days.



Greiner and Friedrichs' Gas Generator.



Neumann's Gas Generator.

2. *Ammonia.*—On allowing water of ammonia to come in contact with solid caustic potassa, a copious current of ammoniacal gas is given off. Two hundred Gm. of caustic potassa will generate ammonia gas during about ten hours. The residuary liquid may easily be freed, by warming, from any remaining ammonia, and may then be used simply as solution of caustic potassa. If a large quantity of solution of ammonia acts at once upon caustic potassa, the reaction is too energetic. Hence, only a small quantity of ammonia should be admitted at any one time.

3. *Nitrogen.*—This is developed by oxidizing ammonia by means of hypochlorites, such as "chloride of lime." In practice it is advisable to employ the cubically compressed chloride of lime recommended by Winkler, and a mixture of equal parts of water of ammonia and water. As the generated gas is not pure nitrogen, it must be conducted through caustic potassa, and afterwards through concentrated sulphuric acid. Sometimes the gas passes through both of these wash-liquids in an impure condition, being mixed with white vapors of chloride of ammonium, but these disappear completely if the gas is passed through a third wash bottle containing hot water.—After *Journ. f. prakt. Chem.*, 1888, vol. 37, 342.

THE graduating class of '88 in the Massachusetts College of Pharmacy was the largest in the history of the institution, numbering 39.

THE

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EDITORIALS.

IT has long been known that certain organic proximate principles, chiefly alkaloids, are very easily affected by reagents, or by certain operations, such as heat, light, etc., to which they are exposed during the process of extraction. The presence of free alkali, particularly, has been known to be quite injurious to a number of these bodies. Yet the importance of this fact has never been so thoroughly realized as it is now, since we have been put in possession of the result of the investigations of W. Will on the correlation between hyoscyamine and atropine, a full account of which will be found on page 141 of this number. It seems to be demonstrated beyond a doubt that belladonna does not contain any atropine at all, but only hyoscyamine, and that the former alkaloid is a secondary product, resulting from the latter under the influence of alkalies or of heat. Before we had read the author's paper half through, the idea occurred to us—and would naturally have occurred to any other attentive reader—that this modifying influence must play an important part also in the case of other alkaloids, and we found at the end of the author's paper that he proposes to investigate other groups of these principles with a view of clearing up their correlation to each other. Of course, those derived from cinchona bark would first come into one's mind. The list of bases so far obtained from cinchona is very large, and the end seems not yet. It appears quite probable that, by a modification of treatment, the alkaloids extracted from any given lot of bark will be found to consist of entirely different proportions of the several bases than when the usual processes now in vogue are employed. If it were possible to isolate these bases by the agency of a substance which would leave them entirely unchanged, a great advance would be made towards a true understanding of the chemical nature of the mother bases, and of the manner in which the secondary ones are derived from it. We await further developments with great interest.

THE inspection of drugs in Massachusetts during the past year, as reported by the State Board of Health, embraced 550 samples, of which 400 were found to be of good quality, 27.27% being adulterated. The same report states that in the case of foods 35.05%, and of milk alone, 38.33% failed to meet the statutory requirements—a comparison quite favorable to the drug-trade. The effect which the enforcement of such a law has is so clearly shown, that we venture to quote a few passages from the report for the information of our readers generally:

"The examinations of drugs made through the past year shows a greater improvement than that of either of the other classes which come within the provisions of the acts relative to inspection, and this is still more manifest when it is known that the collection of samples has been even more closely limited than before to articles liable to adulteration. So great has been the improvement brought about by the administration of the law with reference to drugs, that, whereas it was difficult to find the stronger preparations of opium conforming to the pharmacopœial standard previous to the enforcement of the act of 1882, at the present time such departures from the standard are the exceptions rather than the rule."

In 1883, in a collection of 100 samples of tincture of opium collected in different parts of the State, there were 82% of the number which fell below the standard requirement of at least 1.20% of morphine. In a similar collection made during the past year, the number of samples falling below the standard was but 21.4%.

"It was predicted that great danger would follow the requirement that such preparations should uniformly conform to the standard laid down in the statutes, and that an alarming fatality would be sure to ensue, especially in view of the fact that the opium preparations are among the most valuable and widely used of the officinal articles. No such result, however, has followed, and the registration reports and the returns of medical examiners give ample proofs of this statement.

"There are certain articles, however, which still show a lamentable deficiency in meeting the requirements of the Pharmacopœia. Of these, the most marked instance is found in the compound spirit of ether, and it may be reasonably inquired whether the limited use of this preparation, once so highly valued, may not be due to the habitual omission of its most essential ingredient, the ethereal oil.

"The same remark is also applicable to the pharmacopœial spirits and wines, four in number, brandy, whiskey, red and white wines. The two latter are rarely prescribed or called for under these names, and when they are called for it is also quite as rare to obtain a genuine, unadulterated product."

We give elsewhere extracts from Mr. B. F. Davenport's report on the various articles examined, which should direct the attention of druggists in other parts of the country to the wares most likely to be impure or of deficient strength.

WE have lately had our attention directed to the subject of labels, and particularly to some in which, with the pretext of attaching a label serving to identify the nature of the contents, and the precautions to be exercised in its use, the dispenser covers the greater portion of the vial or box with an advertisement of his business, while the essential feature of the label, so far as the purchaser is directly concerned, is of a very subordinate character. Another fault which is not unfrequently characteristic of this variety of label, is the covering of the only available space for directions with *As Directed* written in a bold hand, thus preventing the small amount of space not occupied by printed matter from being used by the doctor or the nurse for adding directions for use, or a title by means of which the contents may be known. Why a dispenser should write "as directed" on a label when the prescription contains no specific directions, we fail to comprehend. Even when the doctor uses the phrase as a sort of flourish at the end of a prescription we cannot see how it helps the nurse or the patient to have these words on the label; for it may be presumed that in any case the medicine will be used "as directed"; if not according to explicit instructions given with the prescription and intended to be copied on the label, then it must be according to either verbal or written instructions, of which the dispenser has no personal knowledge; and it would be much more reasonable to leave the space for directions blank, to enable those who wish to do so to write whatever may be desirable on it.

Our suggestion would be to leave as much blank space on *every* label as possible, and limit the printed matter to the title and location of the establishment dispensing it, and a sufficient space for the name of the prescriber, date of the dispensing (not the date of prescription), and the number of the prescription. The adjoining scheme will illustrate our idea of a rational label for a two-ounce, oval vial. The arrangement of matter gives the directions the greatest prominence, and the other features will show plainly as the vial is turned edgewise. If the dispenser de-

sires to call attention to any particular features of his business let him use another style of label for the completed package which is devoted to advertising matter, excepting enough space to contain the address of the person who is to receive it, and other directions for the messenger-boy who is to deliver it. This latter label need not be attached with paste, but simply held by the twine which secures the wrapping paper.

RICHARD H. ROE,
GRADUATE OF THE COLLEGE OF PHARMACY OF THE CITY OF NEW YORK,
2047 FOURTH AVENUE,
NEW YORK.

DIRECTIONS:

For.....

Dose.....

.....

.....

.....

.....

Prescription No.....

Dr.....

Date,.....188

We have sometimes wondered that graduates of colleges of pharmacy, who desire to cultivate a prescription business and encourage respect on the part of the public for the professional side of the business of pharmacy, do not state the fact of their graduation upon their labels in some such way as we have indicated in the above model. It is true that the diploma is often framed and hung over the prescription counter, or in some equally prominent position, but so are the licenses to sell tobacco and alcohol and the advertisements of certain beverages, which especially are made to resemble a diploma in general appearance.

Finally, those who dispense prescriptions in New York State should be provided with an extra label in small type to be attached to containers of prescriptions coming within the provisions of Chapter XXX. of the Laws of 1887—something like the following:

According to **Chapter 636,** of the laws of 1887, this prescription cannot be refilled more than once, except on the verbal or written order of a physician.

This will avoid much misunderstanding and trouble for those who have any regard for the law.[1]

Another feature deserving of attention is the management of the cork of a vial. It happens frequently that corks are forced into the neck of a vial with such force that they are twisted off in the effort to extract them, and then, in most households, there is a provoking amount of trouble involved in getting out the retained fragment, and finding another cork to take its place. Quite as often as otherwise this grows out of the habit of using a cork so large that it has, practically, to be disintegrated with a cork-squeezer before it can be got into the neck of the vial, and has not enough tenuity, when once in, to hold together when an attempt is made to extract it. It would, therefore, be a good rule for the dispenser to follow, to always take the cork out and reinsert it to assure himself that it can readily be done by the person who is to use the contents of the vial.

THE labors of the Committee on National Formulary of the American Pharmaceutical Association have been brought to a close by the appearance of the printed text. To carry it through the press has been more of a task than those unfamiliar with such work are aware of. Not by way of an excuse for its late appearance, but as a testimony that reasonable care was exercised during the editing, it may be stated here that of each galley, page-proof, and revise separate sets were sent directly from the printer's office to twenty members or volunteer assistants of the Committee, who forwarded any corrections to the chairman, the latter combining them and sending a corrected proof to the printer. It might be supposed that when twenty or even ten different persons read one and the same sets of proofs, and the editor is watchful, the result will be a work free from errors.

But, among works of the nature of the Formulary, this has probably never happened, at least at the first issue, except by accident. Indeed, we can recall no instance where it did happen. Hence we are not surprised to see a list of errata, but believe it might have been better to have chosen another heading, as we find only about *four* or *five* actual corrections of mistakes (chiefly of figures), while the balance is made up of improvements of language or of processes. We advise our readers, before using the book, to note in the text any correction or alteration quoted under "Errata," on page x. of the work.

We know from experience that the majority of purchasers of new books hardly ever peruse a preface. Of course, there are many books that might just as well be without one, but in the case of the "National Formulary," a careful perusal of the Preface is absolutely necessary to obtain a correct idea of its scope, the general principles followed in its construction, and the best method of its use. Much that we would like to say here is laid down there and explained, and as every reader of this journal will no doubt become the possessor of a copy, if he has not one already, we need not repeat it here.

One matter, however, we would desire to touch upon. It is well known that many previously published collections of formulas have given the latter in such a shape that a very considerable number of preparations had to be carried in stock, of which two, three, and sometimes more were successively required to turn out another which finally formed the constituent of still another preparation. This was a serious drawback, and particular care has been taken by the committee to remove this as far as possible by reducing the stock-preparations to the smallest possible number, and constructing their formulas so that they could be kept for some time in stock without deteriorating.

We have heard remarks made in some quarters that the existence of a "National Formulary," alongside of the Pharmacopœia, is liable to detract from the authority of the latter. There might be some force in this argument, if the former work were merely a "National Formulary," pure and simple. Which it is not. It is the "National Formulary of *Unofficinal Preparations.*" It is self-evident that from the moment when a new edition of the Pharmacopœia adopts a formula for one of the preparations in the "National Formulary," the officinal formula cancels and supersedes the other. The American Pharmaceutical Association puts forward the work merely as a convenient collection of formulæ, most of them already in existence and use, though often made of varying strength, with the recommendation that they be followed, wherever possible, so as to bring about a greater uniformity even in the more ephemeral, unofficinal preparations.

As had been already announced in one of the preliminary reports, the Committee did not want to confine itself to what may be called "elegant pharmacy," but it aimed to embody in the work whatever might otherwise be of practical usefulness. Thus it happens that the work will be found to contain a number of chemicals (as Acidum Hypophosphorosum Dilutum, Acidum Metaphosphoricum Dilutum, Bismuthi Oxidum Hydratum, etc., etc.), several dressings (Carbasus carbolata; etc.), 51 fluid extracts, about 32 tinctures, 7 glycerites, 19 mixtures, 41 solutions (liquores), and a variety of other preparations. Under Pepsinum will be found a method of assay which is believed to embody the best features of all methods heretofore proposed, and which has been tested practically. The U. S. Pharm. requires that "1 part of saccharated pepsin, dissolved in 500 parts of water, acidulated with 7.5 parts of hydrochloric acid, should digest at least 50 parts of hard-boiled egg-albumen in five or six hours at a temperature of 38° to 40° C. (100°–104° F.)." When this test was published, our knowledge of pepsin and its assay did not enable us to give anything better. At the present time, however, we are better situated, and while strict adherence to the officinal digestive strength (1:50) is demanded of the officinal saccharated pepsin (see "Nat. Form.," No. 281), a better method of assay, specially designated for undiluted pepsin, has been introduced, which method is also applicable to diluted pepsins.

It is too soon to review the work as a whole, as the merits of most of the formulæ can only be ascertained by the experience gained upon trial.

The Publication Committee of the Council of the A. P. A., who awarded the contracts for composition and

[1] See text of law on advertising page 44.

electrotyping the text, and for printing and binding the book, decided, in order to emphasize the national character of the work, to omit from the title-page any reference to a city as place of publication. We approve of the senti ment, but think it would have been better to follow the title-page of the Proceedings, or, at least, to mention—perhaps in a note on the back of the title-page—the address of the Permanent Secretary of the A. P. A., to whom intending purchasers could apply.

THE well-known firm of Dodge & Olcott, manufacturers of, and dealers in essential oils, has recently announced that their laboratory records show a material discrepancy between the specific gravities assigned to certain essential oils by the U. S. Pharmacopœia [and other authorities], and those observed by themselves. In the case of those oils which had previously not been manufactured by themselves, they had to rely upon published standards, but since they have enlarged the number of their own products by distilling many essential oils themselves, which they had formerly procured from other sources, they have found that the existing standards, particularly as regards specific gravities, require more or less modification.

This announcement, coming from so reliable a source, is made in the year 1888, more than *five* ye ars after the appearance of the last U. S. Pharmacopœia. Even if the firm had not distinctly stated that these discrepancies have only lately attracted their attention, it might certainly have been inferred that, if these facts had been known to them or to others four or five years ago, the criticism referring to the figures of specific gravity of essential oils in the Pharmacopœia would have been made immediately or soon after the appearance of this work, as it must have been to the interest of any manufacturer to counteract or prevent any condemnation of his products on the plea of their not corresponding to the authoritative standard. But this was by no means the case. The firm in question, with a candor, which is both honorable and rare, acknowledges that it had (like all or most others, no doubt) for a long time been relying upon the accuracy of the figures obtained by acknowledged scientific authorities, and accepted also by the U. S. Pharmacopœia, for the specific gravities of certain essential oils, particularly of such as were not manufactured by themselves. It was only after having themselves undertaken the distillation of certain oils, previously purchased from others, that they found the traditional figures unreliable and requiring modification. This is, of course, an important announcement, and will necessitate an exhaustive study of the whole subject at the hands of the next Committee of Revision of the U. S. Pharmacopœia. The necessity of a revision of the specific gravities of essential oils has also occurred to other large houses en gaged in the business. The well-known firm of Schimmel & Co., of Leipzig, some time ago, rendered valuable service by publishing, as an appendix to their annual report, a table of specific gravities of essential oils, based upon the experience made in their own laboratories (see our volume for 1887, page 129). To show by a glance the discrepancies between the figures given by Schimmel & Co. and those of the U. S. Ph., we have placed them here side by side, to gether with those given by the German Pharmacopœia. Only those officinal (U. S. P.) oils are quoted which are contained in Schimmel & Co.'s table. The Germ. Pharm. gives specific gravities only in some cases. (Figures are printed as whole numbers, referring to water as 1000, at 15° C.)

Essential Oil of	Spec. Gravities.		
	U. S. Ph.	Schimmel & Co.	Germ. Pharm.
Almond, bitter	1060–1070	ab. 1060	.....
Anise	ab. 976–990	985	980–990
Bergamot	860–890	883	.....
Cajuput	ab. 920	925	.....
Caraway	ab. 920	.....	910+*
Caraway, twice rect	.....	900	.....
Cloves	ab. 1050	1060–65	1041–60
Cinnamon	ab. 1040	1030	1055–65
Coriander	ab. 870	867	.....
Cubeb	ab. 920	915	.....
Eucalyptus	ab. 900	922	.....
Fennel	960+	965–975	960+
Juniper	ab. 8	.....	.....
Juniper, twice rect	.....	858	.....
Lemon	ab. 850	854	.....
Mustard	1017–1021	1025	1016–22
Orange Peel	ab. 860	850	.....
Peppermint	ab. 900	903	900–910
Santal	ab. 945	975	.....
Sassafras	ab. 1090	1065	.....
Valerian	ab. 950	945	.....

* Meaning: not below 910; and so in other cases.

The exact determination of the specific gravities of essential oils is a much more difficult task than is generally supposed. Some recent editorial remarks of the *Paint, Oil, and Drug Reporter*, referring to this very subject, contain an implied charge that the last Committee of Revision of the U. S. Ph. has been negligent in their work, and state that "the eyes of the pharmaceutical public are only just opening to this fact." But if it has taken the largest manufacturers and dealers, handling tons upon tons of these oils, nearly *five* years, after the appearance of the U. S. and German pharmacopœias, to pronounce definitely upon what should be the correct specific gravities, was it to be expected that a Committee of Revision, with a multitude of other work on their hands, and who could have made experiments only on the smallest scale, would have arrived, between the years 1880 and 1882, at essentially other results than authorities who had made special studies on this very subject before them, and whose results were generally accepted as trustworthy? Only during the last few years has it been recognized that the results of large manufacturers show, in quite a number of cases, material differences from those obtained in the chemist's laboratory. These differences may arise from various causes. Either there may be a loss from incomplete condensation of the lightest boiling portion, or from incomplete exhaustion of the odorous material, or from unequal degrees of heat, or—and this is one of the principal causes—from the difference in treatment which the crude oil has subsequently undergone. Most crude essential oils, which are obtained by distillation, are subsequently rectified one or more times, and here the large manufacturer has a decided advantage, as, with his superior apparatus, he encounters a much smaller loss by resinification, etc., than the experimenter on a small scale. It is therefore not to be wondered at that differences should be found between the results obtained in one or the other manner. In establishing the proper figures for specific gravities in essential oils in the next U. S. Ph., it will no longer suffice to rely upon the results of even the best experts, if these are arrived at by working on a small scale, but it will be necessary to take into account the products of the manufacturer, for the pharmacist cannot afford to distil his own essential oils, but has to purchase them in the market. The manufacturer should be relieved from the onus of having to defend his bona fide products against supposed standard figures, which may be correct and true for the conditions under which they were obtained, but which it is impracticable for him to imitate.

To accomplish this purpose it will be necessary that the next Committee of Revisions shall be put, by the manufacturers of essential oils, in possession of all data bearing upon this subject, and that the duly appointed experts of the Committee shall be given every facility to study the products of the manufacture under such conditions that full reliance can be placed upon their results.

Ylang-ylang in the Philippine Islands.—The distillation of ylang-ylang is extending very rapidly throughout the Island of Luzon, especially in the neighborhood of Manila and in the province of Albay, and the European markets have unfortunately been flooded with oil, much of it of very inferior quality, although a few of the old established distillers maintain their reputation for excellence of product. The exports of ylang-ylang were 764 kilos in 1884, 1,613 kilos in 1885, and 1,487 kilos in 1886.—*Brit. Cons. Rep.*

Correction.

IN our last number, page 121, the following correction should be made in Mr. Hinsdale's paper, "A Colorimetric Test for Indicating the Morphine Strength of Laudanum." Line 14 of text read: "Which equals about 5¼ grains of the alkaloid."

And on page 132, in Mr. Hindale's article: "Glass Jet for Washing Precipitates," line 23, read: "The glass jet *g* should be adjusted so that the little hole *d* will be about one-quarter of an inch above the surface of the liquid in the filter." Of course, the adjustment must be made so that the liquid will not rise too high or overflow the funnel, and this idea was in the writer's or editor's mind when the original description of the apparatus was written.

QUERIES & ANSWERS.

Queries for which answers are desired, must be received by the 5th of the month, and must in every case be accompanied by the name and address of the writer, for the information of the editor, but not for publication.

No. 2,201.—**Acetanilide** (J. R. C.).

Regarding the therapeutic effects of acetanilide or antifebrin, a large amount of literature is available. For a condensed account we refer you to this journal for 1887, pages 175, 204, 55, 210. For an exhaustive account you should consult Fischer, "Die neueren Arzneimittel," (2d ed., Berlin, 1888); and particularly Loebisch, "Die neueren Arzneimittel," Wien and Leipzig, 1888. In English literature there is no single work, as yet, which gives as much information on this and other of the newer remedies as the above-mentioned two works.

No. 2,202.—**Acetanilid or Acetanilide?** (E. S.).

The term *acetanilid* was introduced by Gerhardt in 1849, in German chemical nomenclature. It was constructed after the analogy of *chlorid, bromid*, etc., which have been rendered in English as *chloride, bromide*, etc. So also the German *Oxyd* is in English *oxide*. For the sake of preserving uniformity, and in accordance with the precedents established by leading English text-books of chemistry, we regard the spelling *acetanilide* (in English) as preferable, the syllable *-ide* to be pronounced like the corresponding part of the word *pride*.

No. 2,203.—**Test for Acetanilide** (J. W.).

The tenor of the note received from this correspondent leads us to surmise that the object is, not to prove the purity of any given sample of acetanilide or antifebrin, but to recognize its presence, and to identify it.

As reactions of identity the following will be amply sufficient. This is the method proposed by the Pharmacopœia Committee of the German Pharmaceutical Association:

On boiling 0.1 Gm. of acetanilide, for one minute, with 1 C.c. of hydrochloric acid, a clear solution results which, when mixed with 3 C.c. of water and 1 drop of liquefied carbolic acid, is rendered onion-red by the addition of solution of chloride of lime (1 : 10). On supersaturating the liquid with ammonia, the red tint changes to indigo-blue.

Ritsert (in *Pharm. Zeit.*) has pointed out another and more simple color reaction. If acetanilide is boiled with hydrochloric acid, and to the cooled liquid a little solution of chloride of lime is added in such a manner that the latter shall form a layer on the former, a rose-red zone, immediately changing to indigo-blue, will form at the line of contact of the two layers.

No. 2,204.—**Acetone-Chloroform** (Senior).

It seems to us that you have confounded two different things. The acetone-chloroform you speak about in the beginning of your letter is evidently the chloroform made from acetone, now controlled by the patent granted to Roessler and Hasslacher. In this case, the word *acetone* indicates only the source from which the chloroform is made. There is no acetone in the chloroform produced by this process. If there were, the product would be unfit for use.

There is, however, an "acetone-chloroform," discovered in 1881 by Willgerodt. This exists in two modifications, liquid (oily) and solid, which are, however, not chemically identical, but merely isomeric. This body is an addition-product of acetone and chloroform, containing both bodies, boiling at 180° C., of an oily character, and colorless when fresh. Exposure to light darkens it. This body is poisonous. Whether chloroform made from acetone is ever liable to contain traces of this substance is doubtful. The acetone-chloroform (last mentioned) is prepared by heating 500 parts of acetone with 1,000 parts (an excess) of chloroform, and 300 to 350 parts of potassa in a flask during two and one-half days, under a well cooled condenser. The mass is filtered, and the filtrate fractionated.

No. 2,205.—**Koumys** (B. J. W.).

The new National Formulary gives a working formula for this preparation under No. 193, "Lac Fermentatum," as follows:

Cow's Milk, fresh	32 fl. oz.
Yeast, semi-liquid	60 min.
Sugar	1 tr. oz.

Dissolve the Sugar in the Milk, contained in a strong bottle, add the Yeast, cork the bottle securely, and keep it at a temperature between 23° and 32° C. (75° to 90° F.) for six hours; then transfer it to a cold place.

We have published other formulas before, and will append yet another, recommended by Dr. E. C. Anderson, of Walsingham, in a paper read before the last meeting of the British Medical Association:

Steam any desired quantity of sweet "old or skimmed" milk until a fairly tough pellicle forms upon the surface; then set it aside for twelve hours, and take off the pellicle and every particle floating upon the surface. Next add of water one-fourth of the volume of the milk, and for each quart of mixture add 20 grains of sodium bicarbonate and 1½ oz. of fine white sugar or "pure clover honey" [? Ed. Am. Dr.]. Then add the ferment, namely, about a quarter of fairly new koumys. Bottle at once in champagne bottles, and securely cork and wire them. Submit them to a uniform temperature of about 80° F. for twelve to twenty-four hours. A drop or two of koumys exuding through the cork shows that the process is complete. The bottles may be shaken and put away in a cool place. It has now a slightly acid taste, and is fit for immediate use, but it will keep good for an indefinite period, except that it daily becomes more acid.

No 2,200.—**Syrup of Oxide of Iron** (Ana).

Oxide of iron, as such, is insoluble in water or other solvents. In the presence of sugar, however, and of an alkali, it is abundantly soluble, the resulting compound being a chemical combination of undetermined composition. A preparation of this kind is officinal in several pharmacopœias of Europe. The new National Formulary published by the American Pharmaceutical Association gives a formula for *Syrupus Ferri Saccharati Solubilis* under No. 368 (p. 130). This furnishes an excellent product. Care should be taken to make the correction indicated on page x. of the Formulary. This preparation is called in the Germ. Pharm. *Syrupus Ferri Oxydati Solubilis*, and it is often called, for short, syrup of oxide of iron.

No. 2,207.—**Photoxylin** (J. E. L. Co.).

This substance, a peculiar kind of gun-cotton made from wood cellulose, was recommended last year by Prof. Wahl, of St. Petersburg, as a superior base for collodion for surgical purposes, as it formed a much tougher and stronger coating than any other. It has been used in photography under the name of Mann's gun cotton, according to information furnished to us by Dr. P. Ch. Elmer, of the Scovill Manufacturing Co., of New York. Fuller information on this subject will be found in our volume for 1887, pages 174, 198, 217.

No. 2,208.—**Standard Strength of Tincture of Strophanthus** (Several Inquirers).

Our attention has been called to the fact that several manufacturers of pharmaceutical preparations specify in their catalogues "Tincture of Strophanthus, 1 in 20," without stating whether this is meant by measure or by weight. And further, one manufacturer announces that he uses the proportions of 1 in 20 *by weight*, while others use the same proportions by weight and measure. We are asked to state which is correct.

In the case of so powerful a drug as strophanthus, uniformity in strength is very important. The authority who introduced the drug into medicine, Prof. T. H. Fraser, of Edinburgh, originated a formula for the tincture which was universally followed, and when it was subsequently modified, upon the basis of extended experience, both therapeutically and pharmaceutically, the new, modified formula was likewise generally followed. This latter formula was published by us in our volume for 1887, on page 65.

It will be found there that 1 oz., or 1 part of the seeds, freed of their comose appendage, reduced to powder and dried, is to be made into 1 pint (Brit. meas.), or 20 fluid parts of tincture.

Now, 1 Imperial pint is equivalent to 19.2 U. S. fluidounces. On calculating the volume which a tincture, made in the same proportions, but starting with 1 troy ounce of the seeds, should occupy, this will be found to be 20.2 U. S. fluidounces, or practically 20 fluidounces.

The "Unofficinal Formulary" of the British Pharmaceutical Conference contains a formula for the preparation, fixing the strength as 1 avoirdupois ounce of the seeds represented by 1 Imperial pint of tincture. The new National Formulary of the American Pharmaceutical Association has a similar formula, the strength of the preparation being 1 troy ounce of the seeds represented by 20 fluidounces (U. S.) of tincture.

It will, therefore, be seen that these two tinctures are practically identical. The British formulary has been published and in use for some time, and is probably accepted as a guide in England by all who have occasion to make or use any of its preparations. We are not aware that any one has criticised the formula as establishing a standard differing from that recommended by Prof. Fraser.

But if any one were to make the tincture *weight* for *weight*, that is, if he were to make from, say 1 troy ounce of seeds, 20 troy ounces of tincture, the resulting preparation would be very much different. Assuming that officinal alcohol has been used for extracting the seeds, and that the specific gravity of the tincture is 0.830, then 20 troy ounces of this would measure about 25.4 fluidounces. Such a tincture would, therefore, be about 25 per cent weaker.

If such a strength has been adopted by any manufacturer, it is probably due to a misconception of the term "fluid part," which is an unfortunate innovation of the last British Pharmacopœia, and has often led to error. Under "fluid part" is meant "the volume of an equal num-

ber of parts [by weight] of water." Hence, "20 fluid parts," in the above formula, is exactly equivalent to "20 Imperial fluidounces," because each Imperial fluidounce is equivalent to 437.5 grains, or 1 avoirdupois ounce of water.

No. 2,209.—**Colored Sealing Wax** (Milwaukee).

The following may answer your purpose, for capping bottles:

1. *White.*

Bleached Shellac	340 parts.
Venice Turpentine	160 "
Plaster of Paris	100 "
Magnesia	15 "
Subnitrate of Bismuth	150 "
Carbonate of Lead	235 "

Melt the Turpentine in a capacious copper kettle over a charcoal fire, and gradually add the Shellac. When a uniform melted mass has resulted, gradually add the solid ingredients, which must be in form of finest (bolted) powder, under constant stirring. Then remove the kettle, keep stirring until the mass cools short of solidifying, and pour it out into forms.

2. *Yellow.*

Shellac	380 parts.
Venice Turpentine	320 "
Rosin	160 "
Plaster of Paris	50 "
Magnesia	10 "
Chrome yellow	80 "

Proceed as directed under 1.

3. *Green.*

Shellac	500 parts.
Venice Turpentine	250 "
Rosin	150 "
Magnesia	20 "
King's Yellow (Yellow Litharge)	60 "
Mountain (Sander's) Blue	30 "
Oil of Turpentine	20 "

Proceed as before, except that the coloring matters are best triturated to a fine paste with the Oil of Turpentine, and this paste added to the melted mass in small quantities at a time. Mountain Blue is a copper color.

No. 2,210.—**Friedrichshall Bitterwater** (Akron).

According to Raspe, artificial Friedrichshall Bitterwater may be prepared by dissolving in 10,000 parts of water the following quantities of salts calculated as *dry*, expressed in parts and fractions of parts:

Sodium Bromide	1.276
Potassium Chloride	1.696
Sodium Chloride	114.999
Calcium Chloride	11.145
Sodium Sulphate	7.643
Magnesium Sulphate	109.470
Sodium Bicarbonate	9.502

The total quantity of solids contained in 10 liters will then be about the same as that contained in the natural water itself.

Dieterich gives a simplified formula in the *Pharm. Centralh.:*

Potassium Sulphate	1.0
Sodium Sulphate, dry	40.0
Sodium Chloride	115.0
Sodium Bicarbonate	10.0
Sodium Bromide	1.4
Calcium Sulphate, precip.	16.5
Magnesium Sulphate, dry	133.0

Mix the salts intimately, and preserve the mixture in a well-closed bottle.

The above quantity is sufficient to make 10 liters (say 10½ quarts) of artificial mineral water. But it is best to keep the salt in form of mixture. When a dose of the water is wanted, take a *tablespoonful* of the salt, introduce it into an 8 ounce bottle, fill up half full of water, shake until the salt is dissolved, then fill up the bottle with carbonic acid water, and cork immediately, or take it at once, if required.

No. 2,211.—**Sachet Powders** (D. & Co.).

We append a few formulæ from our files (after Hell):

1. *Orris Sachet Powder.*

Orris Root, coarsely powd.	2 lbs.
Musk	24 grains.
Eau de Bretfeld (see below)	½ fl. oz.
Benzoin, powd.	90 grains.
Deodorized Alcohol	2½ fl. oz.
Oil of Bergamot	½ "
" Lemon	360 minims.
" Cloves	½ fl. oz.
" Lavender	½ "
" Cinnamon, Ceylon	36 drops.
" Rose	40 minims.

Macerate the Benzoin with the Deodorized Alcohol for about one week and filter. Free the powder from fine dust, then mix the liquids and incorporate them with the powders.

Eau de Bretfeld is prepared by macerating 30 drops of oil of neroli, 15 of oil of rose, 50 minims of oil of lavender, 110 of oil of cloves, 330 minims, each, of oil of bergamot and lemon, 4 grains of musk, 75 grains of vanilla [or two grains of vanillin] with 1 quart of deodorized alcohol during a few weeks.

2. *Heliotrope Sachet Powder.*

Orris Root, coarsely powdered	1 lb. 7 oz.
Lavender Flowers, crushed	3½ oz.
Rose Leaves, crushed	3½ "
Tonka Beans, crushed	5 "
Vanilla, crushed	2 "
Musk	45 grains.
Oil of Bitter Almond	20 drops.
Oil of Rose	20 "

3. *Sachet aux Millefleurs.*

Orris Root, coarsely powdered	1 lb.
Benzoin, coarsely powdered	3½ oz.
Lavender Flowers, coarsely powdered	3½ "
Rose Leaves, coarsely powdered	3½ "
Tonka Beans, coarsely powdered	1½ "
Melissa Leaves, coarsely powdered	1½ "
Vanilla, coarsely powdered	½ "
Cinnamon, coarsely powdered	½ "
Storax	½ "
Musk	30 grains.
Civet	15 "
Patchouli Essence	180 min.

Patchouli Essence may be made by dissolving 16 grains of oil of rose and 144 grains of oil of patchouli in 1 quart of deodorized alcohol.

No. 2,212.—**Linne's Botanical Works** (Camden).

The best and most compact work, embodying the whole Linnean system of botany, with detailed references to the original works of Linné, is the following: Caroli Linnæi Systema, Genera, Species Plantarum, Uno Volumine, etc. Ed. Herm. Eberh. Richter. 4to, Leipzig, 1840, pp. xxxii., 1,102. With an index volume of 202 pp.

No. 2,213.—**Physician's License in Washington Territory** (A. W. S., Pomeroy, O.).

Can any of our readers inform this correspondent whether a diploma is necessary for practising medicine in Washington Territory?

No. 2,214.—**Formulæ asked for.**

We do not know the composition of the following preparations. Perhaps some of our readers can supply the information.

1. Lithiated Hydrangea.
2. Renne's Magic Oil.
3. Sandford's Liver Invigorator.
4. St. Antonius Liniment.
5. Epidermaline and Dermaline.
6. Denton's Balsam.

BIBLIOGRAPHY.

THE PHYSICIAN'S BEDSIDE RECORD, for the Systematic Recording of Clinical Notes and their Permanent Filing for Future Reference. Copyright, 1888. by GIDEON C. SEGUR, M.D. Hartford, Conn. : Plympton Manuf'g Co.

THIS is by all odds the best thing of the kind we have yet seen. It is 3¼x6¼ in. in size, has a manilla paper cover and an abundance of space for all the necessary notes of a case lasting through four weeks, and costs 50 cents per doz.

NINETEENTH ANNUAL REPORT OF THE STATE BOARD OF HEALTH OF MASSACHUSETTS. Boston : 1888, pp. 375, 8vo.

WE give elsewhere numerous extracts from this model report and commend them to the careful attention of our readers.

THE THREE ETHICAL CODES, ETC., ETC. THIS is issued by the Illustrated Medical Journal Co. of Detroit, and costs 50 cents. It contains the Constitution and By-Laws of the American Medical Association, and the Ethical Codes of this Association, The American Institute of Homœopathy and the National Eclectic Medical Society. It does *not* contain the ethical code of the Medical Society of the State of New York and is, therefore, of much less general value.

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AN editorial notice of this work will be found elsewhere in this number. Further notices will appear hereafter, as opportunity offers. Intending purchasers may obtain the work either through the book-trade, or through the authorized agents of the A. P. A., or from Prof. J. M. Maisch, Permanent Secretary of the A. P. A., at Philadelphia, Pa.